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Layaway Procedures for U.S. Army Facilities: Inspection, Maintenance, and Repair of Historic Buildings

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This report describes the specific requirements for laying away historic buildings, providing guidelines for inspection and periodic maintenance and repair (M&R) for key building systems, components, and subcomponents.

Topics discussed include definitions of historic buildings, Federal guidelines for laying away historic buildings, inspection purposes and guidelines, and categories of required M&R for laid away historic facilities. Appendices to this report include eight extensive checklists to help guide the inspection and M&R of major building systems and components.

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Foreword

This research was conducted for the U.S. Army Engineering and Housing Support Center (USAEHSC), now the Installation Support Division, under MIPR E87920381, dated July 1992; reimbursable Work Unit "Layaway Procedures for Historic Buildings." The USAEHSC technical monitor was Dr. Constance Ramirez.

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1 Introduction

Background

The U.S. Army has thousands of buildings that are either on the National Register of Historic Places, or potentially eligible for it. Many of these buildings are at installations scheduled to close or to be reduced in size by the Base Realignment and Closure (BRAC) Act. At affected installations, some historic buildings will be transferred to other public organizations and some may be retained by the Army for possible future use. The buildings that are to be retained must be laid away—placed in an inactive status that prevents them from deteriorating and makes cost-effective future reactivation possible. Many buildings to be transferred to other users also will need to be placed in a layaway status until transfer.

In 1991 the U.S. Army Construction Engineering Research Laboratory (CERL) published a two-volume technical report addressing the complete scope of the facility layaway process for U.S. Army installations: deactivation, periodic maintenance and repair (M&R), and reactivation (Uzarski et al., July 1991). The report, *Layaway Procedures for U.S. Army Facilities, Volumes I and II*, was developed in large part because existing regulations (AR 210-17, January 1967) were not comprehensive enough in providing technical M&R guidance to field personnel. Volume I discussed layaway decision criteria and economics; Volume II contained detailed M&R inspection checklists for use by personnel responsible for laid away facilities. These volumes addressed an immediate need in the field because very little had been published about facility layaway. However, the research dealt with nonhistoric structures.

The layaway of historic buildings, on the other hand, involves important considerations that were beyond the scope of the original layaway research. For example, historic buildings often include unusual, delicate, or sensitive materials. Consequently, the checklists provided in Volume II of Uzarski et al. (July 1991) are not directly applicable to the layaway of many historic structures. Furthermore, there are many laws specifically governing the treatment and M&R of historic buildings (36 CFR 800, January 1991; "Section 106...." October 1986; and The National Historic Preservation Act, 1966, as amended). Therefore, follow-on research was required to develop procedures specifically for the deactivation,

periodic M&R, and reactivation of historic facilities. The U.S. Army Engineering and Housing Center (now the Installation Support Division) tasked CERL with developing and documenting such procedures.

Objective

The overall objective of this research is to develop procedural guidelines for the layaway of historic buildings on U.S. Army installations. The objective of this phase of the research was to consolidate reference material and expert opinion into a document that can be used in the field to meet the immediate needs of personnel tasked with the layaway of historic facilities.

Approach

The current work started with the body of reference material collected for *Layaway Procedures for U.S. Army Facilities* (Uzarski et al., July 1991). The authors conducted a limited literature search to supplement the material in hand, but no new information was acquired.

It was intended that the current report should function as a stand-alone document encompassing the essential features of the earlier two-volume publication. Consequently, this report includes both narrative chapters and detailed M&R inspection checklists. However, the narrative chapters here include only the essential points presented in Volume I of *Layaway Procedures for U.S. Army Facilities* to give the reader a general background. Readers seeking more detail or background should refer to Volume I, *Decision Criteria and Economics* (Uzarski et al., July 1991).

The procedural checklists in Appendixes C through J are based on those published in Volume II, *Inspection and Maintenance and Repair Checklists* (Uzarski et al., July 1991). They were modified where appropriate, based on expert opinion from CERL researchers and other historic building consultants, to meet the specific needs of the Army to layaway historic buildings. As in Volume II, procedures were identified for each different type of system, component, and material. The intent in this report, as well as in Volume II, was to make the component checklists as generic as possible to promote use at the widest possible range of installations. The checklists in the current report incorporate the existing (but limited) state-of-the-art technologies for facility layaway of historic buildings. This phase of the research did not include the investigation of innovative methods of layaway.

Recognizing that the management of historic buildings involves philosophical, legal, and procedural considerations not central to more generic layaway activities, this report briefly discusses those topics.

This report may be used as a stand-alone document at the installation level by Directorate of Engineering and Housing (DEH) or Directorate of Public Works (DPW) personnel to plan a layaway program for historic buildings. It is applicable to any installation under any Major Army Command (MACOM) where facility layaway may include historic buildings.

The narrative portion of this report is of use to anyone who wants to better understand inspection and M&R procedures for layaway of historic buildings, or the philosophy and assumptions behind the development of the checklists. The checklists are primarily for the use of facility inspectors, planners, estimators, and others who need to identify specific work needs, prepare work orders, or prepare contracts to maintain the laid away facilities.

These procedures are not intended to be the “final word” on the subject. Some buildings, due to any number of unique aspects, may demand different (or more intensive) actions than outlined here. As explained in Chapter 2, a review of any layaway plan is required before implementation. These checklists provide the basis for formulating a plan. The review process may reveal the need to modify the plan, and include extra procedures.

Finally, it must be emphasized that this document is a report of *interim* findings. Due to the imminent closure of several Army installations with historic facilities, it was concluded that this guidance is needed in the field immediately, even if the scope is limited. Comprehensive findings will be published as soon as they are compiled and validated.

Scope

This report does not address life-cycle cost analysis of layaway or different levels of M&R for historic buildings (as Volume I did for nonhistoric buildings). Also, this report discusses only historic buildings—no other types of structures or facilities are addressed.

Mode of Technology Transfer

After follow-on research produces all-encompassing documentation of procedures for laying away historic facilities, including cost analysis issues, incorporation of this material into an Army Technical Manual or Department of the Army Pamphlet (DAPAM) would be appropriate.

Metric Conversion Factors

U.S. standard units of measure are used throughout this report. A table of metric conversion factors is presented below.

1 in.	=	25.4 mm
1 ft	=	0.305 m
1 sq ft	=	0.093 m ²
1 gal	=	3.78 L
1 psi	=	6.89 kPa
°F	=	(°C × 1.8) + 32

2 The Philosophy, Law, and Special Considerations of Laying Away Historic Buildings

This chapter addresses some of the central issues pertaining to the layaway of historic buildings, including:

- Characteristics of historic buildings
- Why historic buildings are protected by Federal regulations
- Layaway and its effects on historic buildings
- The Federal guidelines for laying away historic buildings
- Special considerations that may not be specifically addressed in the guidelines
- The people who can assist in the implementation of these guidelines.

What is a Historic Building?

The definition of historic properties, according to 36 CFR 800, is "any prehistoric or historic district, site, building, structure, or object, included in, or eligible for inclusion in, the National Register." This report addresses only historic buildings, not other types of structures or the sites themselves. However, land directly adjacent to historic buildings is included in the discussion.

The term "eligible for inclusion on the National Register" includes both properties formally determined as such by the U.S. Secretary of the Interior and all other properties that meet National Register listing criteria. To be eligible for inclusion in the National Register, a building or structure must have historic integrity and meet one or more of the four specific criteria for listing in the National Register, as set forth by Section 106 of The National Historic Preservation Act of 1966 (NHPA), as amended. According to the National Park Service,

"The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings,

structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history." ["How to Apply the National Register Criteria for Evaluation," June 1982, p 1]

These criteria are designed to guide the states, Federal agencies, the Secretary of the Interior, and others in evaluating potential entries. Most Army buildings more than 50 years of age are potentially eligible for listing in the National Register and should be evaluated. Buildings less than 50 years of age may also be potentially eligible because of exceptional historical or architectural significance, particularly buildings associated with the Cold War. Therefore, *all* buildings should be evaluated according to the Section 106 review process before proceeding with any undertakings.

Why Historic Buildings Are Protected by the Federal Government

Historic properties are an important means by which citizens study their history and preserve their heritage. Historic military properties are especially significant because they serve as examples of military design and engineering. They are also important because of their association with prominent political and military figures over the years, and because of the important role that military installations have played in meeting mission requirements and in preserving the safety and security of the United States since its beginnings.

During the decades of the 1950s and 1960s, hundreds of Federal projects, such as dams, highways, and urban renewal, were completed with little regard for historic resources that were valued by the communities in which they were located. These

projects destroyed or damaged thousands of historic properties, much to the concern of local citizens.

The NHPA addressed these concerns, and has been amended and strengthened several times since its passage. The NHPA established today's national historic preservation program, which includes elements for identification, assistance, and protection of historic properties.

Federal agencies are required by law to comply with the NHPA, and to identify and address the issues of historic buildings [Section 106, October 1986]. In essence, this means that an honest attempt must be made to identify historic properties, the possible effects of proposed undertakings on these historic properties must be considered, the SHPO must be consulted, and the Advisory Council on Historic Preservation (ACHP) must be allowed the opportunity to comment on the undertaking and its effects prior to beginning the undertaking. Failure to do so may result in litigation, fines, project delay, and increased costs.

Layaway's Effect on Historic Buildings

Layaway Definition

For the purposes of the procedures described in this report, layaway is defined as an undertaking to prepare a building to be closed.

- For an indefinite period of time, during which the building may be maintained in anticipation of future occupation
- For a definite period of time, during which the building will be maintained at some level for reactivation or for transfer to another owner
- With no future plans of reuse, and with no funds allocated for inspection, maintenance, or repair.

Layaway of a facility may or may not have an effect on historic buildings. According to 36 CFR 800.9(a),

“An undertaking [layaway] has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.”

Evaluation Criteria of an Undertaking's Effect

According to 30 CFR 800.9(b), entitled "Criteria of Adverse Effect,"

"An undertaking [layaway] is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include, but are not limited to:

- (1) Physical destruction, damage, or alteration of all or part of the property (ex: cutting off brackets, projecting window and door surrounds, etc., and covering the building with vinyl siding);
- (2) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register (ex: building storage facilities on a central, prominent parade ground, thus altering the character of the area and reducing the significance of buildings which surround the parade ground);
- (3) Introduction of visual, audible, atmospheric elements that are out of character with the property or alter its setting (ex: replacement of a clay tile roof with composition shingles);
- (4) **Neglect of a property resulting in its deterioration or destruction (ex: failure to maintain, repair, or periodically inspect a historic building due to lack of funds or personnel); and**
- (5) Transfer, lease, or sale of the property."

Exceptions to the Criteria of Adverse Effect

"Effects of an undertaking [layaway] that would otherwise be found to be adverse may be considered as being not adverse for the purpose of these regulations:

- (1) When the historic property is of value only for its potential contribution to archeological, historical, or architectural research, and when such value can be substantially preserved through the conduct of appropriate research, and such research is conducted in accordance with applicable professional standards and guidelines;

- (2) When the undertaking is limited to the rehabilitation of buildings and structures and is conducted in a manner that preserves the historical and architectural value of affected property through conformance with the Secretary's "Standards for Rehabilitation and guidelines for Rehabilitating Historic Buildings"; or
- (3) When the undertaking is limited to the transfer, lease, or sale of a historic property, and adequate restrictions or conditions are included to ensure preservation of the property's significant historic features." [36 CFR 800.9 (c), emphasis added]

Evaluation of Findings

When applying the criteria of effect and adverse effect, there are three possible findings:

- No effect: there is no effect of any kind (neither harmful nor beneficial) on the historic properties
- No adverse effect: there could be an effect, but it would not be harmful to those characteristics that qualify the property for inclusion in the National Register
- Adverse effect: there could be an effect that could diminish the integrity of such characteristics.

After determining the effect of an undertaking, the agency must contact the SHPO to obtain concurrence with the findings.

Federal Guidelines That Must be Followed in Laying Away Historic Buildings

Protection of historic buildings falls under the NHPA of 1966, as amended. This act contains two essential parts: Section 100 and Section 106. Interpretation and clarification of these regulations can be found in 36 CFR 800, the regulations governing the Section 106 review process. U.S. Army facilities must also follow AR 420-40. Furthermore, there are special regulations that must be followed when laying away National Historic Landmarks (NHLs).

Section 106

Section 106 requires that a Federal agency head with jurisdiction over a Federal, Federally assisted, or Federally licensed undertaking take into account the effects of the agency's undertakings on properties included in or eligible for the National

Register of Historic Places. Before approval of such an undertaking, the agency head must offer the Advisory Council on Historic Preservation (or "Council") a reasonable opportunity to comment on the undertaking.

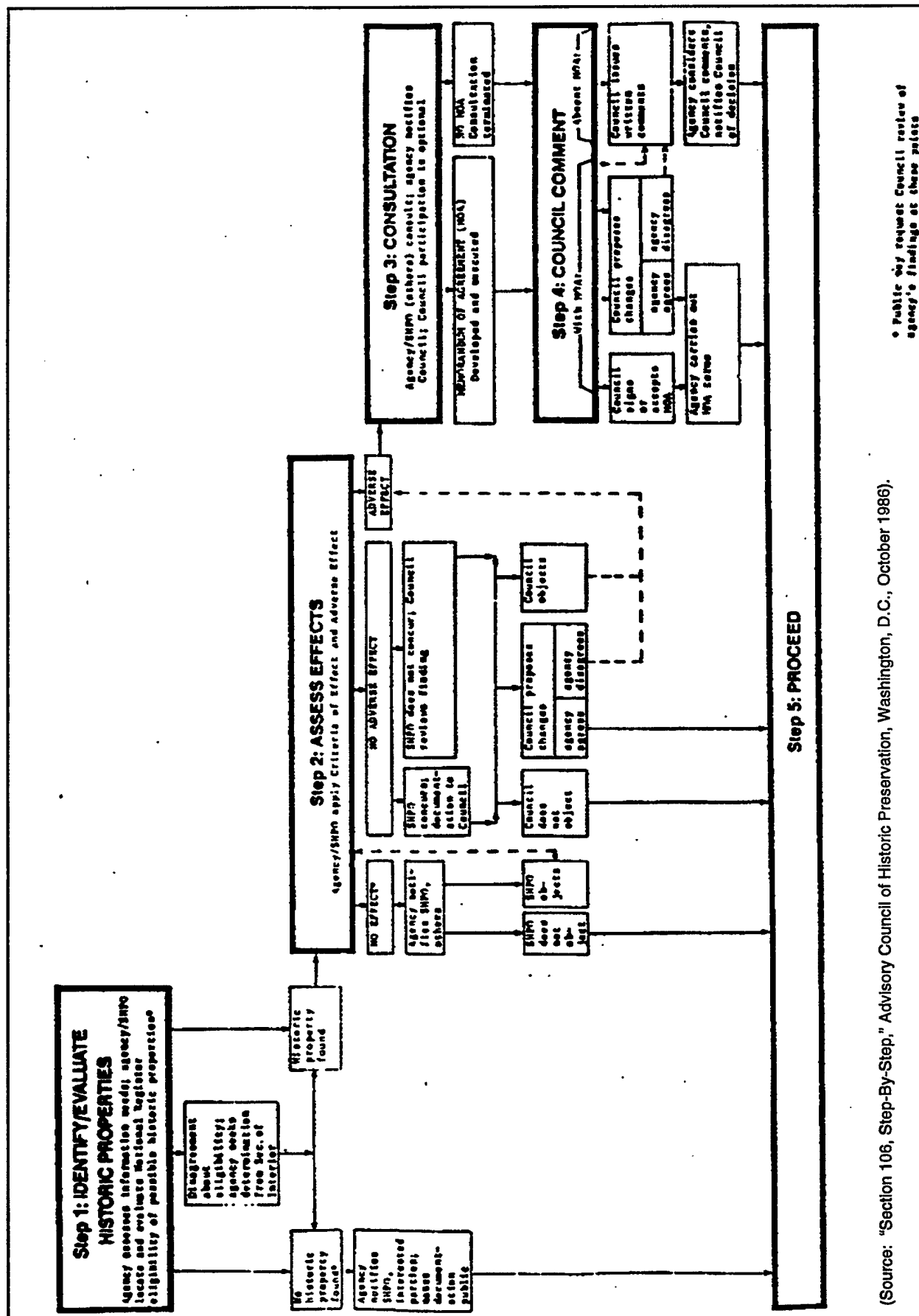
The Section 106 review process is a five step process, as listed below, and is designed to identify and protect historic buildings. Figure 1 includes a flow chart that indicates the proper sequence of action, based on possible scenarios.

Step 1. Identify and Evaluate Historic Properties: Once an agency has established that its proposed action constitutes an "undertaking," it must make a reasonable and good-faith effort to locate historic properties. This effort is carried out in consultation with the SHPO, and should be consistent with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation*. [48 FR 44716 - 44742, September 1983].

The agency must also request the SHPO's views about whether further actions are needed to identify historic properties. It may be advisable, for instance, to conduct building surveys or carry out additional background research to uncover facts about a building or group of buildings whose historic significance may be in question. Before proceeding to Step 2, the agency must have an evaluation and letter from the SHPO indicating the status of *all* buildings in the area of the undertaking, and a preservation plan approved by the SHPO.

Step 2: Assess Effects. The agency consults with the SHPO to determine whether or not the proposed activity could affect the historic properties which have been identified. The agency's determination is based on the Criteria for Adverse Effect [36 CFR 800.9(b)].

Step 3: Consultation. If an agency's proposed undertaking is determined to have an effect on the historic buildings, the agency initiates consultation to consider ways to avoid, reduce, or mitigate the adverse effects of the undertaking. The agency must first notify the Council that consultation is beginning. Then the agency initiates consultation. At the very minimum, consultation takes place between the agency and the SHPO. The Council may also become involved at the request of the SHPO or the agency, or may involve itself without invitation. Other interested parties, such as local government leaders, owners of affected lands, or other interested persons as deemed appropriate by the SHPO, may also be consulted.



(Source: "Section 106, Step-By-Step," Advisory Council of Historic Preservation, Washington, D.C., October 1986).

Figure 1. The basic steps of Section 106 review.

In most cases, the consulting parties can reach an agreement on ways to accommodate historic preservation needs as the undertaking proceeds. The product of this agreement is a Memorandum of Agreement (MOA) that contains specifications for how the undertaking will be carried out, to avoid or mitigate adverse effects, or to accept such effects. For example, it is the Army's policy to fully protect all its historic properties from deterioration to the greatest extent possible. In a layaway process, however, the MOA may specify the different levels of layaway based on the public interest (see CPW technical bulletin 420-10-08). Additionally, in the case of historic property being transferred to a third party, provisions will stipulated in the MOA for treatment of the property by the new owner, and the transfer documents shall include these provisions.

The MOA is submitted to the Council for review. If the Council is a consulting party, its execution of the MOA concludes the Section 106 process. If the Council is not a consulting party, the agency submits a signed MOA for Council review, which is described in Step 4 below.

In the event that an agreement cannot be reached, and it is believed by consulting parties that further consultation will be fruitless, the agency must request the Council's comments on the undertaking, notify all other consulting parties of its request, and provide the Council with specific forms of documentation (as described in Step 4).

Step 4: Council Comment. If an MOA has been submitted and the Council is a consulting party, its execution of the MOA serves as the Council's comment on the undertaking. If the Council is not a consulting party, its review and acceptance of the MOA serves as the Council's comment. The Council must respond within 30 days of receiving the MOA.

If an MOA has *not* been concluded and submitted to the Council, documentation about the undertaking must be submitted to the Council. This documentation includes a description of the undertaking, the historic properties involved, the possible effects of the undertaking on the historic buildings, a listing of possible alternatives or mitigation measures that were considered but not accepted, proof of consultation with the SHPO and other involved parties, and the agency's views of the undertaking. The Council then must respond to the agency with written comments within 60 days.

Step 5: Proceed With Undertaking. If the Council has commented by executing or accepting an MOA, the agency simply proceeds with the terms of the MOA.

If an MOA has not been accepted by the Council, the agency must take into account the Council's written comments, then make a final decision about how to proceed with the undertaking. The agency then notifies the Council of its decision—if possible, before the undertaking proceeds.

This step then satisfies the agency's statutory responsibilities under Section 106.

Section 100 Requirements

Under Section 100, all Federal agencies must carry out their programs in accordance with, and in furtherance of, national historic preservation policy; designate historic preservation officers to coordinate the agency's activities under the act; identify and preserve historic properties under their ownership or control; and make efforts to minimize harm to National Historic Landmarks. This is accomplished by compliance with AR 420-40 and through an Installation Historic Preservation Plan (HPP).

National Historic Landmarks

National Historic Landmarks (NHLs) are sites and buildings that have been identified by the NHL program as clearly having national significance. These may include sites and buildings representing one or more of several themes, such as Original Inhabitants; Political and Military Affairs, Westward Expansion (1763-1898), and America at Work. Examples of Army NHLs include Fort Monroe, Fort Leavenworth, and Fort Huachuca.

36 CFR 800.10(c) discusses NHLs under "Protecting National Landmarks." It states that Section 100(f) of NHPA requires that the agency official, to the fullest extent possible, undertake such planning and actions as may be necessary to minimize harm to any NHL that may be directly and adversely affected by an undertaking.

It further states the Council, when commenting on such undertakings, must use the process set forth in 36 CFR 800.4 through 800.6 and give special consideration to protecting National Historic Landmarks. As part of this special consideration, the Council must be included as a consultant in the Section 106 review process. The Council may also request that the Secretary of the Interior provide a report to the Council, detailing the significance of the property, the effects of the undertaking on the property, and the actions recommended to avoid, mitigate, or minimize adverse effects. Finally, the Council is required to report its comments, including

the MOA, to the President, the Congress, the Secretary of the Interior, and the head of the agency responsible for the undertaking.

Questions and Answers About Special Historic Layaway Issues

The following questions, which are not directly addressed under Section 106 or 36 CFR Part 800, are commonly raised by facility agents.

Q. Are there alternatives to the case-by-case process in Section 106?

- A. Yes, there are two possible alternatives: Programmatic Agreements and Counterpart Regulations.

Programmatic Agreements may be appropriate for programs or projects.

1. When the effects on historic properties are similar and repetitive, or are multistate or national in scope
2. When effects on historic properties cannot be fully determined prior to approval of the undertaking
3. When non-Federal parties are delegated major decisionmaking responsibilities
4. That involve development of regional or land-management plans
5. That involve routine management activities at Federal installations.

Two recent Programmatic Agreements are the "Amended Programmatic Memorandum of Agreement Among the United States Department of Defense, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Concerning Realignment and Closure of Army Installations in Accordance with Base Realignment and Closure Act" (BRAC), and the "Amended Programmatic Memorandum of Agreement Among the United States Department of Defense, the Advisory Council on Historic Preservation, National Conference of State Historic Preservation Officers, and the Historic American Buildings Survey/Historic American Engineering Record, Regarding Demolition of World War II Temporary Buildings" (WWII Temporary PMOA).

The WWII Temporary PMOA allows for undertakings on all WWII wood temporary buildings whose types have been identified and documented, without going through the case-by-case Section 106 process. This agreement is periodically updated with notations about facilities visited and structures documented by CERL's Cultural Resources Research Center, Champaign, IL.

Counterpart regulations may be developed by agencies working with the Council's professional staff to meet the objectives of Section 106 while reflecting particular agency needs. When concurred in by the Council, counterpart regulations substitute for the Council's regulations. An example is AR 420-40 prescribes Army policy, procedure, and responsibilities for carrying out NHPA, managing historic preservation requirements through a Historic Preservation Plan, following professional standards for Army preservation personnel and projects, and accomplishing the historic preservation program in a timely and efficient manner.)

Q. What does the BRAC agreement say about historic buildings?

- A. BRAC specifically addresses the concerns of historic buildings affected by base closure and realignment. Stipulations in the agreement describe the milestones that must be met by the facility and the authorities that must be contacted before layaway of historic buildings. Section VII-A of the agreement cautions the Army to take special actions to identify and protect facility historic buildings during a BRAC action, and to consult with the SHPO and the Council during the BRAC process. [Base Realignment and Closure, December 1988]

Q. How should buildings be handled if they become potentially eligible for the National Register *after* they've been laid away?

- A. If an agency has fully complied with Section 106 requirements, it is unlikely that a historic building will be "discovered" after the facility has been laid away. However, a facility may be laid away for longer than originally anticipated, and during this extended time period, a building could become potentially eligible for the National Register. This is most likely to happen in historic districts where buildings become contributing elements to the district, or with buildings that are more than 50 years of age. Agencies are encouraged to develop a plan to address such a situation, should it arise.

Plans for handling newly eligible buildings should be included in the documentation developed during the "assessment of effects" and "consultation" steps of the Section 106 process. If buildings become eligible during the layaway period, the agency follows the plan approved during the consultation and Council comment steps of the Section 106 review. When it has done so, the agency has met its Section 106 requirements for the newly eligible properties.

If the agency has not developed a plan to prepare for buildings that may, during the layaway period, become eligible for the National Register, the agency must afford Council the opportunity to comment on effects to these buildings by:

- Creating an amendment to the original MOA
- Complying with 36 CFR 800.6 of NHPA, which means preparing an MOA for Council comment, or requesting Council comments in absence of an MOA.
- Developing and implementing actions to handle the newly eligible buildings, taking into account the undertaking's effects on the buildings, and the SHPO's and Council's comments. If this option is chosen, the SHPO and Council should be notified at the earliest possible time.

Resources for Clarifying Federal Guidelines and Implementation of Layaway of Historic Buildings

- **Installation Preservation Officer:** The installation official with responsibility for complying with Section 106. It is the responsibility of the Preservation Officer to identify and evaluate affected historic properties, assess an undertaking's effect upon them, and afford the Council its comment opportunity. The Preservation Officer may use the services of applicants, consultants, or designees to prepare the necessary information and analyses, but it is ultimately the Preservation Officer who is responsible for the Section 106 Process.
- **Installation Historic or Museum Director:** May be the primary source of information on the historic significance of historic properties or groups of properties which may be affected by the layaway process.
- **Cultural Resources Research Center, CERL:** P.O. Box 9005, Champaign, IL 61826-9005 (1-800-USACERL or 217/352-6511). May assist in interpretation of preservation laws, programmatic agreements, and provide general information or act as a reference center for building preservation.

- **National Conference of State Historic Preservation Officers (NCSHPO):** Suite 332, Hall of States, 444 North Capitol Street, NW., Washington, DC 20001-1512 (202-624-5465). NCSHPO is made up of SHPOs from every State and U.S. territory. The NCSHPO is called upon to arbitrate cases involving more than one state, or to oversee Programmatic Agreements affecting more than one state.
- **State Historic Preservation Officer (SHPO):** This is the official in each State or U.S. territory who (among other duties) consults with Federal agencies during Section 106 review. The SHPO administers the national historic preservation program at the State level, reviews National Register nominations, and maintains file data on historic properties that have been identified but not yet nominated. SHPOs are appointed by the Governor of their respective State or territory.

Agencies seek the views of the appropriate SHPOs while identifying historic properties and assessing effects of an undertaking on historic properties and assessing effects of an undertaking on historic properties. Agencies consult with the SHPO when developing MOAs.

Names, locations, and telephone numbers for individual officers can be obtained from the Facility Preservation Officer or by contacting NCSHPO.
- **Advisory Council on Historic Preservation (ACHP):** 1100 Pennsylvania Avenue NW., Suite 809, Washington, DC 20004. This is an independent Federal agency composed of 19 members. The Council is charged with advising the President and the Congress on historic preservation matters and administering the provisions of Section 106 of the National Historic Preservation Act. The various duties of the Council that are defined by regulations in 36 CFR 800 are carried out by council members, the Chairman, and the Executive Director, according to an internal delegation of authority.

Summary of Regulatory Aspects of Layaway

This section has discussed the basic legal requirements that must be addressed before laying away historic buildings, but it is critical that facility agents bear in mind that they must be sensitive to the needs of historic properties **during and after the layaway process**. Historic properties must be maintained and protected and elements of the building that contribute to its historic fabric must not be allowed to deteriorate out of neglect. Human intervention that could compromise the historic integrity of the building must not be allowed.

It cannot be stressed too strongly that historic buildings—or those that are potentially eligible for listing in the National Register—are protected under the law, and **must be maintained** during the entire Section 106 process.

3 Inspection Requirements for Historic Buildings

The layaway cycle for a historic building will consist of a deactivation phase, a periodic inspection phase, and possibly a reactivation phase. Each phase requires an aggressive building inspection program. Early detection and repair of distresses will help preserve the historic nature of building components, avoiding unnecessary failure and loss of those components. Volume I of Layaway Procedures [Uzarski et al., July 1991] includes a thorough discussion of this topic.

Inspection Purposes

Deactivation

Inspection at this phase of a historic building layaway cycle identifies critical M&R needs that must be corrected before the building is allowed to stand vacant. This inspection places emphasis on identifying and correcting those distresses in historical components which, if not corrected, will begin, continue, or accelerate degradation of other historical components during deactivation. Such degradation will not only inflate future M&R needs, but may seriously diminish the historic character of the building.

Periodic Inspection

Periodic inspections find and identify distresses that have occurred since the last inspection. These distresses, if not corrected, will degrade the historic character of the building during deactivation.

Reactivation

Inspection at this phase of a historic building layaway cycle identifies all defects that need to be corrected at reactivation. This will ensure that the facility attains a maximum degree of functionality, including quality of life and restoring the historic nature of the building, if required.

Inspection Frequencies

The frequency recommended for inspecting deactivated facilities is semiannual. The philosophy behind this frequency is that early detection and correction of distresses helps to preserve the historic character of the building and deter further degradation of historical elements. The risk of rapid deterioration of historic features resulting from defects undetected for more than 1 year will rise, as will the associated costs for the required restoration or preservation of the features.

Laid away facilities should also be inspected after violent storms, etc., so any damage discovered can be identified and corrected. Such inspection and repair will prevent any extraneous elements from degrading the historical elements in the building.

Inspection Effort

Optimally, a two-person team is desirable for historic building inspections. One member of the team should be well versed in civil, architectural, and structural matters, and the other member should be well versed in electrical and mechanical matters. Both members of the team should have a clear understanding and appreciation of historical facility matters.

Inspector Judgement

Defects may be found that the building manager would normally defer until reactivation, but due to the severity or rate of degradation, will require rapid attention. Inspector judgment on reporting such deficiencies for corrective action must prevail.

Inspection Guidelines

Written guidance, including detailed checklists that show the user which distresses to inspect for in a historic building at deactivation, during layaway, and at reactivation has been developed and included as appendixes to this report. Appendix A discusses historic buildings in terms of their constituent systems, components, and subcomponents. Appendix B explains how to use the M&R checklists. The checklists are found in Appendixes C through J. Figure 2 is a sample checklist showing specific inspection items and when they should be

inspected per type of scenario. The intent is to list items that, if found, will be corrected by M&R actions before the next inspection.

EXTERIOR CLOSURE SYSTEM				
EXTERIOR WALL SURFACES				
NOTE: D = Deactivation S = Same materials P = Periodic L = Like materials yr = year R = Reactivation N = Different materials d = days				
BRICK MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Broken or missing units	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling mortar	D/P/R R	X	X	X
Missing mortar	D/P/R			X
Bowing or bulging	D/P/R R	X	X	X
Out of plumb	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Efflorescence; locate source of water penetration	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Control joints	D/P/R R	X	X	X
Clogged weep holes	D/P/R R	X	X	X

Figure 2. Example of inspection checklist.

4 Developing Maintenance and Repair Guidelines

The technical aspects of historic building layaway are complex. The actions required to lay away (deactivate, periodically maintain, and reactivate) a specific historic building depend on a number of variables. This chapter outlines those variables and explains how they are used to develop the guidelines presented later in this report.

Variables

The key variables considered on this study are:

- Deactivation period
- Reactivation period
- *Heat* and *No Heat* alternatives
- Systems, components, and subcomponents
- Materials
- Climate
- Maintenance standards
- Types of M&R

Each is discussed in the pages that follow.

Deactivation Period

The length of time that a building is to be laid away (deactivated) plays an important part in developing a layaway strategy for a building. Short and long deactivation periods were considered in this study. The definition of a *short* layaway period is deactivation for less than 1 year. A *long* layaway period is defined as deactivation for 1 year or longer.

Both the short and long term periods will require scheduled M&R to combat expected annual deterioration of the historic buildings components. However,

different M&R actions are possible. With short deactivation periods M&R can be more temporary in nature, with the intention of having historic restoration or permanent M&R actions undertaken at reactivation.

As a subset of the short deactivation period, a period of 30 days was also incorporated. This 30-day period is, in essence, a scenario whereby the existing occupants vacate a building and a new occupant will take custody and occupy the building in short order. In this instance, no layaway will occur, but some M&R may occur to facilitate transfer. These requirements will be outlined in the MOA, as discussed in Chapter 2.

Reactivation Period

The reactivation period may play an important part in developing a strategy for historic building layaway. Conceptually, the shorter the reactivation period, the higher the maintained condition must be. As Volume I of this report series [Uzarski, July 1991] explained, short reactivation times are determined by operational needs. This interim report assumes that a rapid mobilization mission does not exist for these historic buildings; that most will be laid away pending transfer to another agency or use by a future Army tenant. Thus, this variable is fixed to be greater than 45 days. Volume I [Uzarski, July 1991] addresses the significance of the 45 day cut off.

Heat and No-Heat Alternatives

As discussed in Uzarski et al. [July 1991], the impact of *heat* versus *no-heat* affects some facility components more than others—particularly components related to steam and condensation. However, economics do not justify heating, if the historic building is properly deactivated. Humidity control through ventilation is a much more critical parameter, and is addressed later in this chapter.

Systems, Components, and Subcomponents

Another factor in developing layaway procedures is the determination of M&R needs for the varying systems, components, and subcomponents of historic buildings. A wide variety has been identified, and will be discussed later in this chapter.

A logical basis for developing procedures is by dividing a building into systems. Providing systems will also require a further division into a variety of components and subcomponents. For example, the exterior closure system of a building

includes as components exterior cladding, exterior ceilings, exterior floors, windows, doors, stairs, and decorations and trim. Each of these historical components will have its own M&R needs.

Materials

Materials used in the systems, components, and subcomponents of an historic building generally contribute to the historic nature of the building. Thorough inspection, maintenance, and repair is required to prevent items from failing and being lost forever.

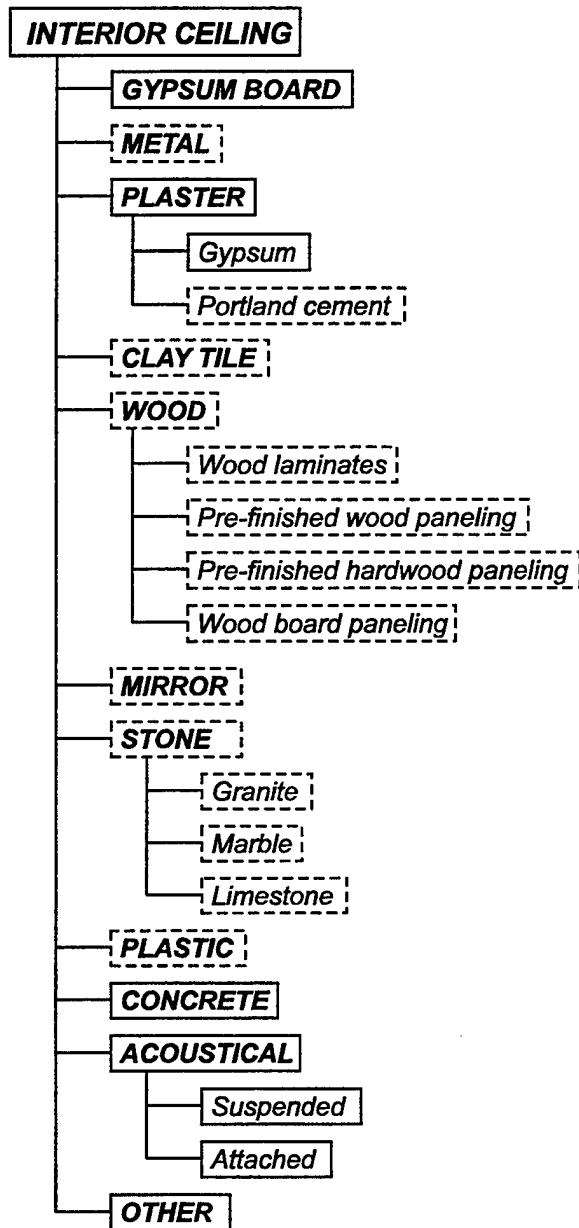
Because this is an interim report, not every possible different type of material has checklists associated with it. Figure 3 shows an example of the breakdown of a building and what checklists are and not yet available. Appendix A has the total building breakdown showing which systems, components, subcomponents, and material types checklists that CERL has or has not developed.

Climate

Any M&R strategy *must* consider the climate of the region in which the building is located. Figure 4 shows the United States divided into a number of climatic regions. Different layaway actions are required in different regions to compensate for the effects of climate on layaway. The study of regional climate impacts was beyond the scope of this phase of the research. In general, the authors believe that these guidelines will apply to all the climatic regions shown in the figure. However, local conditions may allow variation of the inspection and M&R procedures according to "common sense." For example, Zones 6 and 7 in the figure have a low probability of freezing. Therefore, adding propylene glycol to the traps and drains to prevent freezing may not be necessary, so an alternate material may be used. Another example: due to the low amount of rainfall in desert regions, looking for fungal growth on wood siding will probably not be necessary.

Extreme climatic conditions (semitropical and tropical) will require special attention to correct sources of water infiltration that arise during deactivation. One way to give special attention to these areas would be to increase inspection frequency. In lieu of doing an annual inspection for water-related items, a semi-annual inspection may be advisable.

INTERIOR CONSTRUCTION SYSTEM

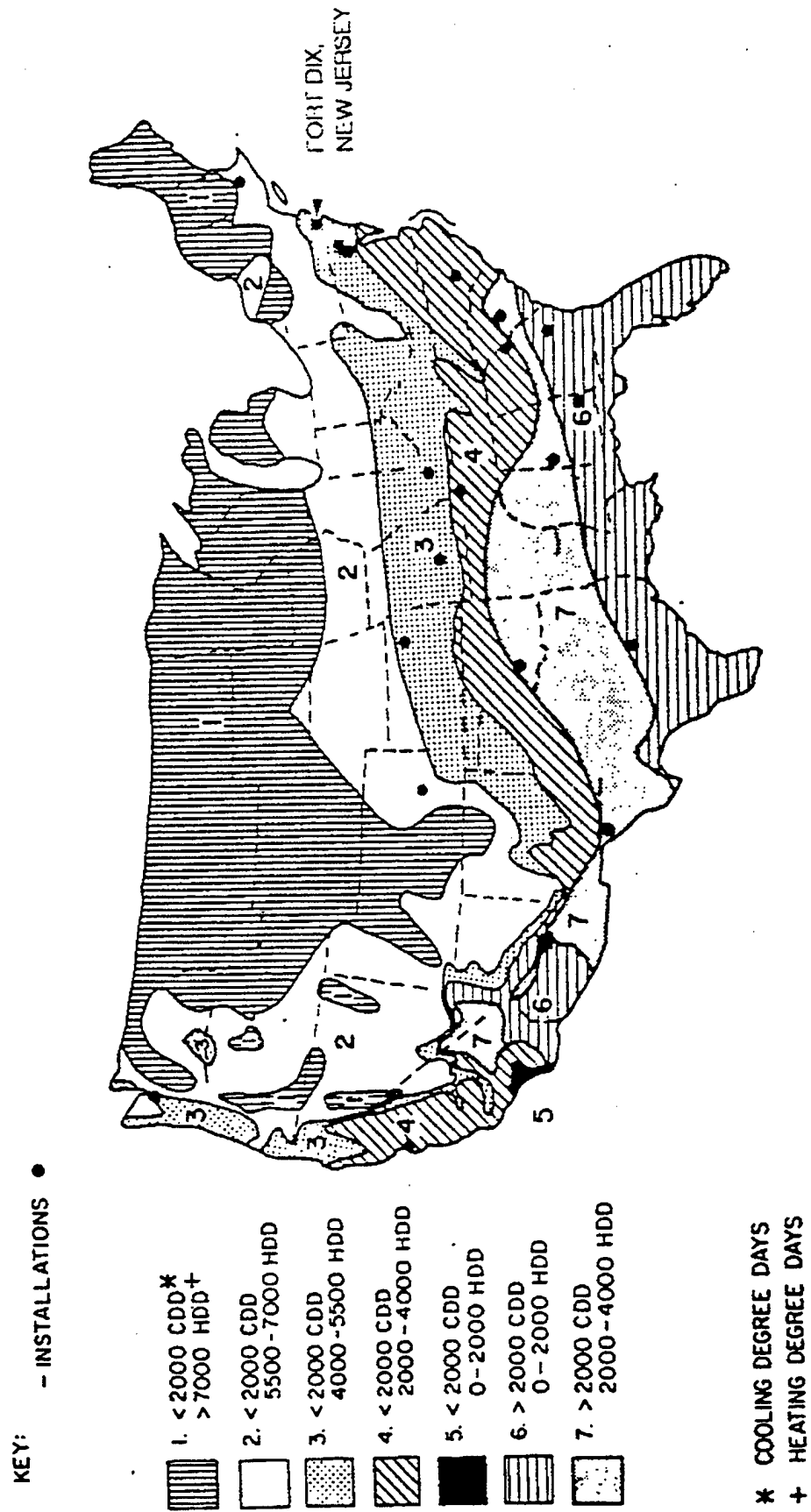


NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists;

Figure 3. Subcomponents and materials of interior ceilings.



(Source: Hittle et al., March 1983.)

Figure 4. U.S. climate regions.

Maintenance Standards

The definition of a maintenance standard is the level of maintenance necessary to sustain a facility at a desired condition. Each condition level would presumably enhance or detract from the historic character. Figure 5 illustrates this concept, where each possible maintenance standard for the deactivated building requires a different level of effort for periodic M&R and reactivation. Volume I of Uzarski et al. [July 1991] explains this concept in more detail.

This study attempts to define two practical levels of maintenance: *historic* and *do-nothing*. A description of each standard follows.

Historic standard. This standard was created to reflect the professional engineering judgment of CERL in-house and industry professionals. The primary issues include life safety, serviceability, and overall component integrity. The focus is on preventive maintenance and early detection and correction of deficiencies that, if left alone, will accelerate facility degradation and lead to higher reactivation costs or loss of historic character. By implementing this standard, a historic facility can remain in satisfactory condition throughout the layaway period with reactivation costs and loss of historic character held to a minimum. This standard is the goal in the guidelines presented in Appendixes C through J.

Do-nothing standard. This, in reality, is no standard at all. As applied here, the installation would spend zero dollars to deactivate or maintain historic laid away buildings. On the surface this may seem an attractive strategy, but it is **not** recommended nor should it be allowed. This strategy will allow the historic elements of the building to degrade and fail. Once the historic components have degraded, the historic character is lost.

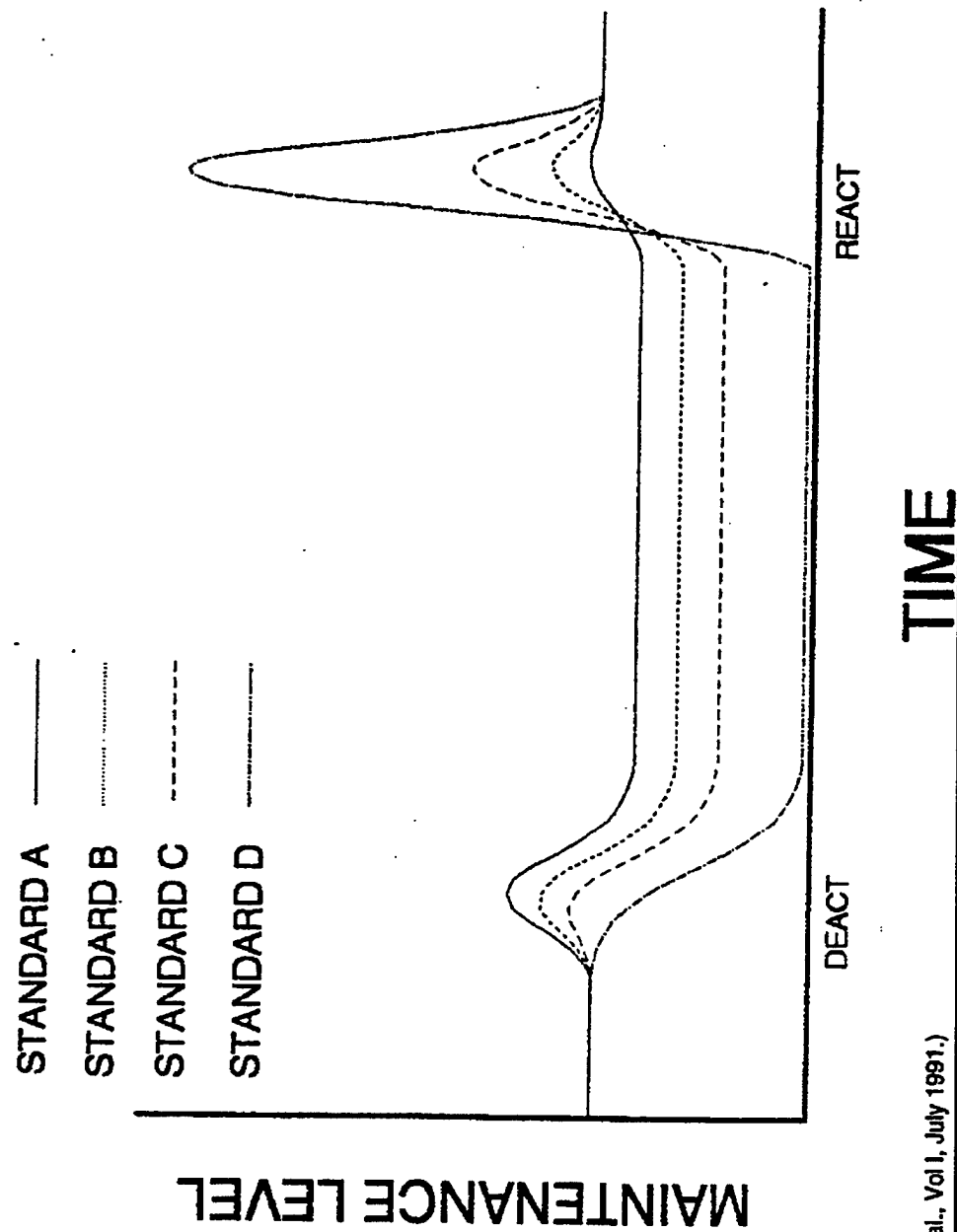
Maintenance and Repair Types and Methods

The type and method of repair of a laid away facility is yet another variable—one that is likely to be outlined in the MOA (see Chapter 2). The three different types of layaway repairs are: *permanent*, *temporary*, and *do-nothing*.

Permanent

There are three types of permanent repairs: repair with same materials, repair with like materials, and repair with dissimilar materials. The differences of these repairs are discussed below.

MAINTENANCE STANDARD CONCEPT



Source: Uzarski et al., Vol 1, July 1991.)

Figure 5. Maintenance standard concept.

Repair with same materials. To maintain the historic nature of a building, system, or component, it is often required to repair the distresses with the same material as originally constructed or currently used. This method is the preferred method of many SHPOs. For example, a clay tile roof on a historic building may be leaking because several tiles are missing and the roofing felt beneath the tiles is torn or missing. If replacing the tiles with anything but clay tiles distracts from the intrinsic historic value of the building and roof, then only clay tiles should be used in the repair.

Repair with like materials. This repair method may or may not detract from the historic nature of the building. SHPOs and the Council will approve this method of repair on a case-by-case basis. Continuing with the above example, the roofing tiles could possibly be replaced with a composite material tile that looks almost exactly like the original tile.

Repair with dissimilar materials. This method may be approved if the system or component is not historic or is out of plain view of the public. Continuing with the roofing example, if the tile roof were not considered historic, and a prudent engineering analysis recommended replacement with a different roofing system, then it may be considered. However, even if the clay tile is considered historic, the roofing membrane under the tiles may possibly be replaced with a different material because, in a sense, this component is "buried" within the roof.

The reader is cautioned, however, to seek advice from the SHPO when permanent repairs of this nature seem to offer a variety of options.

Temporary Repairs

The intention of temporary repairs is to preserve the historic integrity and watertightness of the building until more permanent repairs are appropriate. A temporary repair should last 60 to 90 days. This period will allow enough time to properly plan and execute permanent repairs.

Temporary repairs must be made with materials that are easily removed and do not damage historic components. For example, temporary repairs can be made with tarpaulins, plywood, felts, or other materials that will not permanently affect the historic nature of the building. Patching materials like roofing cement should not be applied to a copper roof, for example, because it would be difficult to remove and it would detract from the historic nature of the roof. Temporary repairs do tend to alter the historic aspect, temporarily.

The Do-Nothing Option

Not all distresses will be repaired, either at deactivation or periodically. As discussed in Chapter 4, the inspection process focuses on distresses that should be repaired. Some distresses, although present, may be deferred until the building is reactivated. Permanent repairs should be accomplished at that time.

Other Considerations

There are other considerations that will enter into the layaway strategy. The following paragraphs summarize these variables. A more thorough explanation is given in Volume I of Uzarski et al. [July 1991]. These variables are:

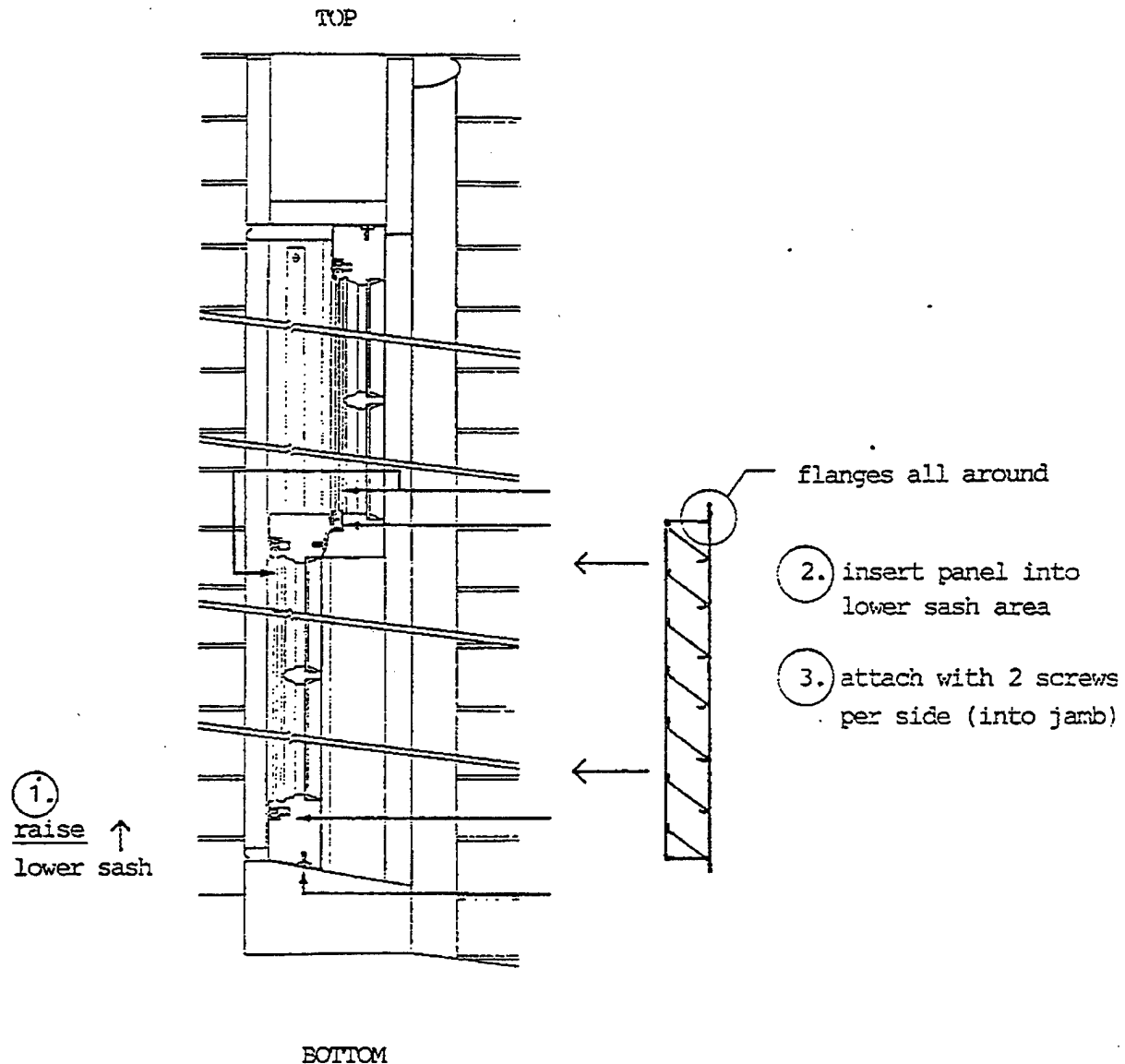
- ventilation
- security
- environmental
- building services.

Ventilation

When in active use, historic buildings are ventilated with mechanical systems designed for that use, and through passive methods such as opening and closing windows. These methods prevent fungal growth and condensation inside. The National Park Service has found that good air movement within a laid away building, and the equilibrium between interior and exterior humidity levels and temperatures produced by proper ventilation will help preserve historic interior finishes [Fisher 1985]. Odors also can be eliminated through ventilation.

Depending on the historic building, either mechanical or passive ventilating procedures can be used. Mechanical methods incorporate the use of existing air-handling equipment. Passive procedures capitalize on natural air flow. At a minimum, all laid away buildings should be vented passively if it is possible to do it effectively, because it is the least expensive way. To install a passive system would require the placing of louvers in windows so they would function as vents [Figures 6 and 7]. This would be done when the building is deactivated. Care must be taken to correctly size and install the louvers to avoid spoiling historic characteristics.

Louvers are to be strategically located on opposite sides throughout the building and on each floor, to ensure proper air flow (Figure 8). Approximately 1 sf of louver is required for every 100 sf of floor space requiring ventilation. The dimensions of



(Source: Fisher et al. 1985).

Figure 7. Window louver no. 2.

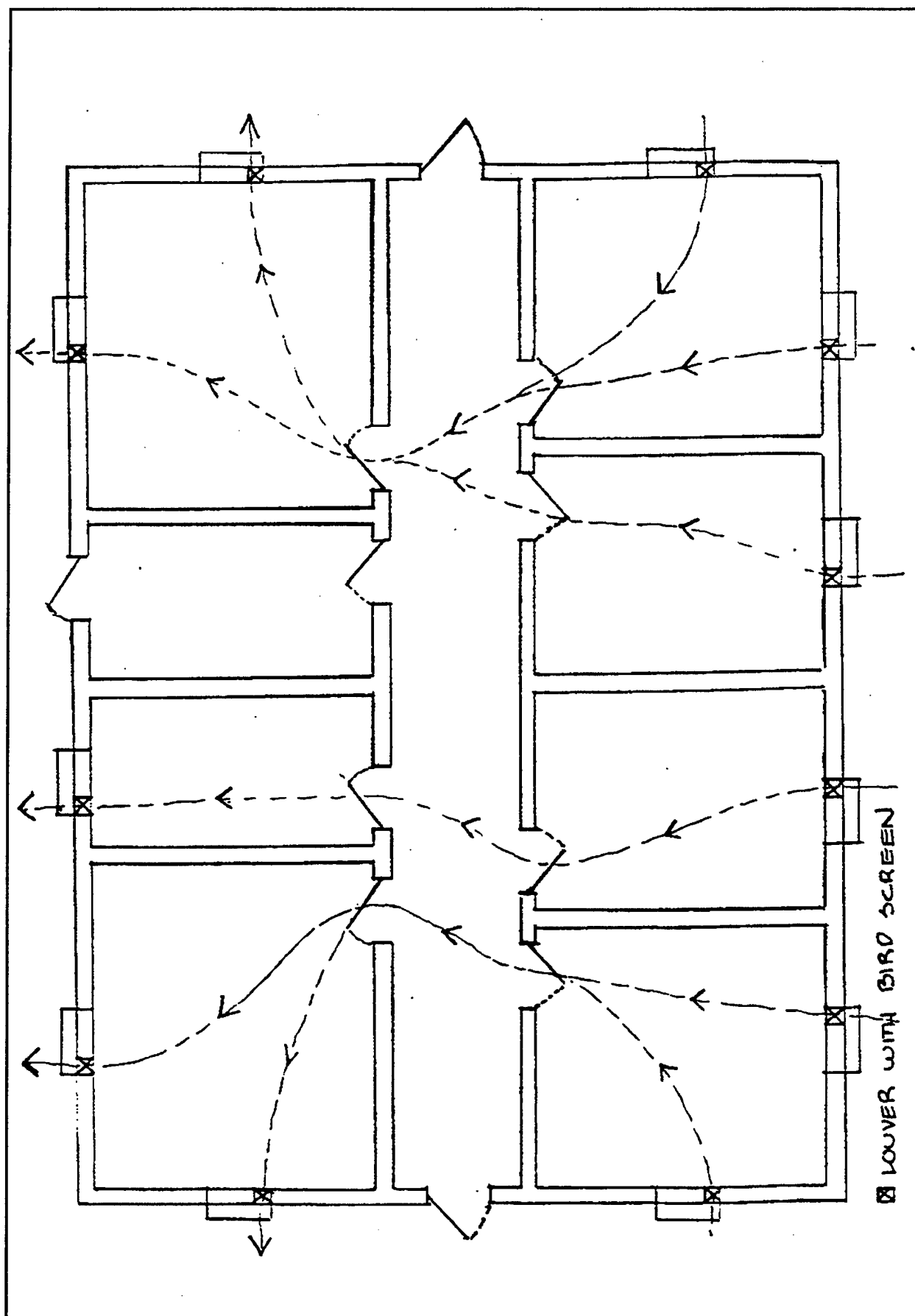


Figure 8. Example of ventilation plan.

the existing window frame openings must be field-verified before order, manufacture, and installation of the louvers. All interior room doors are to be wedged in a fully-opened position to allow air circulation. Where applicable, exit stairwell fire doors are to remain closed.

Louvers may be necessary to keep out moisture, vermin, insects, unauthorized personnel, or anything else that would accelerate degradation of the buildings and yet allow ventilation to occur. Simply opening windows will not work. An open window is an invitation to unauthorized personnel and animals to accelerate the degradation process. Therefore, the installation of louvers would provide security on the lower floors while providing ventilation. The louvers could be affixed so the windows can operate normally if the buildings were only to be reopened for short periods. Since these louvers are designed to be installed over existing windows, it is recommended that windows remain open during the summer. This practice would increase the amount of passive ventilation. During the winter, the windows could be closed because the required amount of passive ventilation is lower.

Some buildings cannot be vented passively. A lack of windows or poor configuration of building design may make it necessary to use the existing air handler. In these instances, the use of humidistats to activate the system is recommended.

To use an existing mechanical ventilation system, some modifications will be needed. The air handler fans will need to be run to minimize the relative humidity within the building. The present controls for determining fan operation, based on time of day or interior temperature, should be replaced with components that sense and compare inside and outside relative humidity (RH). The control system will ensure that the fan does not deliver outside air above 70 percent RH. The control strategy will also ensure the air handler unit is providing fresh air to the building if the inside RH is above 80 percent and the outside air is below 70 percent RH. For proper operation of this strategy, it is very important to locate the indoor humidistat in a space that tends to have the highest humidity. This location will ensure that moisture-related damage to the building and its contents is minimized. Even if the outside air is above the acceptable level for delivery to the building, it may be necessary to run the air handler unit to mix the air within the building and help eliminate any zones with unacceptably high humidity.

Security

Good security is important in preserving a building's historic components and preventing damage and loss of pilferable items that add to the historic nature of the

building. Volume I of Uzarski et al. [July 1991] provides a good discussion of possible security measure could be used in laying away a historic building.

Environmental

Many different environmental concerns could emerge in the layaway of a historic building. There may be an underground storage tank that supplies fuel oil to the heating system, corrugated asbestos roofing, asbestos sheetrock, asbestos flooring, or lead paint inside the historic building. These materials have inherent concerns that the person laying away a historic building must address. Volume I of Uzarski et al. [July 1991] includes a detailed discussion of these matters.

Building Services

During layaway periods, certain building services must be retained, and others are optional. Generally, this involves retaining electric service to power sump pumps, security alarm systems, and other critical functions. Power for security lighting, interior lights to aid in inspections, and security personnel are examples of optional services.

Incorporating Variables Into the Decision Process

The above variables have been incorporated into a set of M&R guidelines that address actions to be taken to deactivate, periodically maintain, and reactivate historic buildings. A sample M&R checklist is shown in Figure 9. The full set of guidelines completed at this phase of the research is presented in Appendices C through J. An explanation of how to interpret and use each one precedes the checklists. The variables are incorporated into the guidelines as follows (see Figure 9):

- Deactivation (layaway) period. Three deactivation periods are shown: one of less than 30 days ($D < 30$), one of less than 1 year ($D < 1\text{yr}$), and one of greater than 1 year ($D > 1\text{yr}$).
- Reactivation period. This is not self-evident from the checklist. As explained earlier in this chapter, the reactivation period is greater than 45 days.
- *Heat versus No-heat*. Again, this is not self-evident from the checklist. As explained earlier, the checklists were developed using a no-heat scenario.
- System (interior construction).
- Component (interior floors).
- Subcomponent (floor surface).

- Material (wood).
- Climate. Again, this is not self-evident from the checklists. The checklists were originally developed for the climate in and around Fort Dix, NJ. The authors believe that the checklists can be generally applied throughout the United States.
- Maintenance Standard. As explained in the text, this is the **historic** standard.
- Maintenance and Repair Type. All repairs for the checklist (N, C, S) are assumed to be permanent.

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation S = Same/Like
 P = Periodic Material
 R = Reactivation N = Different Material yr = year
 X = Item to be inspected C = Compatible Method d = days

WOOD FLOORING	When to Inspt	D<30d	D<1yr	D>1yr
M&R activities as required:				
Repair or replace damaged areas	D/P R	S	S	N/S S
Replace broken, missing, or rotted sections	D/P R	S	S	N/S S
Readhere loose sections	D/P R	S	S	N/S S
Eradicate insect infestation	D/P R	C	C	C
Clean surfaces	R	C	C	C
Refinish surfaces	D/P R	C	C	C

Figure 9. Example of maintenance and repair checklists.

Final Considerations

The checklists are developed to be guidelines to help the historic building manager set up a layaway strategy for the building. They identify which distresses to look for in each material type and describe how to repair those distresses.

A layaway action on a historic building is by nature an adverse action on that building. Because a historic building is involved, the procedures in Chapter 2 must be followed. To follow those procedures, a layaway strategy must be developed. These checklists in the appendixes serve as a starting point for developing a layaway strategy. Installation personnel can delete nonappropriate checklists or add distresses to the different material types as required to develop the strategy. If needed, the SHPO can be involved in developing the strategy. Once that strategy is developed, The Council can comment on it. If everything is agreed on, an MOA can be issued and the layaway strategy executed.

5 Summary and Recommendations

Summary

The approach taken in this phase of the research was to consolidate existing information on technologies into a single source. This was accomplished primarily through the adaptation of procedures described in Volume II of Uzarski et al. [1991]. The major points of the work can be summarized as follows:

1. The layaway of historic buildings scheduled to close or transfer to new owners is necessary if the buildings are to remain unused for more than 30 days.
2. Layaway requires scheduled M&R to combat the deterioration typical of unused building systems and components. Buildings cannot be simply "locked up" until needed. Regardless of whether the buildings are in use, the forces of deterioration will continue to demand correction through regular M&R. Therefore, a do-nothing approach is **not** recommended. If no clear guidance is given on what will ultimately happen to a building, or when it will happen, the long-term layaway approach should be taken.
3. If a periodic facility inspection program as described in Chapter 3 is not currently underway, one should begin as soon as possible.
4. Because the procedures described in this report were originally developed for facilities in the Fort Dix, NJ, climatic region, application of these procedures to buildings outside that climatic region should be considered only with caution. However, while deterioration modes and rates for certain distress types will differ in other climatic regions, these checklists are considered generally applicable for facilities in all U.S. climatic zones. Common sense will initially indicate whether procedures must be modified to address special aspects of the local climate (such as excessive rainfall or extended periods of heat and humidity).
5. The decision to heat buildings or not should stem from economics. Volume I of Uzarski et al. [1991] showed that heating is not economical if buildings are properly deactivated and maintained according to the recommended guidelines. On the basis of this interim work, that conclusion is assumed to be valid for historic buildings as well. Further consideration may be required for historic buildings suffering from water intrusion or made from structural materials such as brick or stone.

6. In humid environments, humidity control through ventilation is a key parameter in minimizing building interior deterioration.
7. Installations that may be closed or reduced in size should at the earliest opportunity survey its buildings to identify any of historical significance. Any nonhistoric buildings to be laid away may be governed by the layaway procedures described in Volume II of Uzarski et al. [1991]. Buildings found to be historic or potentially historic should be laid away according to the procedures described in the current report.
8. A specific set of M&R actions is not necessarily dictated just because a building is considered historic. Different variables will determine the correct action. These variables include the length of layaway period, whether the building is to remain heated, material types used in construction, climate, and condition.
9. Historic buildings that are to remain in the Army inventory in a layaway status should have a complete condition and M&R strategy evaluation performed at least every 5 years to map the building's M&R requirements for the next half-decade.
10. The procedures described in this report are appropriate to serve as a starting point in developing a layaway plan. The layaway plan must be reviewed according to applicable regulations. The review process may generate suggestions for modifications or additional actions.

Recommendations

It is recommended that:

1. Comments on the use of the procedures described in this report should be reported to CERL for incorporation into a comprehensive final report on laying away historic facilities.
2. A controlled test of the procedures described in this report should be designed and carried out at one or more sites. Such a test should consist of inspection and monitoring of building systems and components to determine modes and rates of deterioration. The needs related to periodic M&R and required reactivation should be compared with the needs and budgets expected if a historic facility were to remain open.
3. The entire topic of historic layaway must be directly addressed as part of an expanded study. This expanded study should include types of facilities and materials not addressed in this report, and should address major regional climatic variables that may affect layaway procedures. The expanded study should also seek to validate the procedures described here.

4. The economics of historic facility layaway as part of M&R strategy development should be studied. This would facilitate the budget planning process to ensure that proper funding levels are allocated for historic buildings.
5. Ultimately, the findings of this and all future historic layaway research should be published as a Department of the Army Technical Manual.
6. Through the integration of database management software, the checklist procedure should be computerized, to give users the capability of extracting from the checklists only the pertinent information required to meet a specific need.

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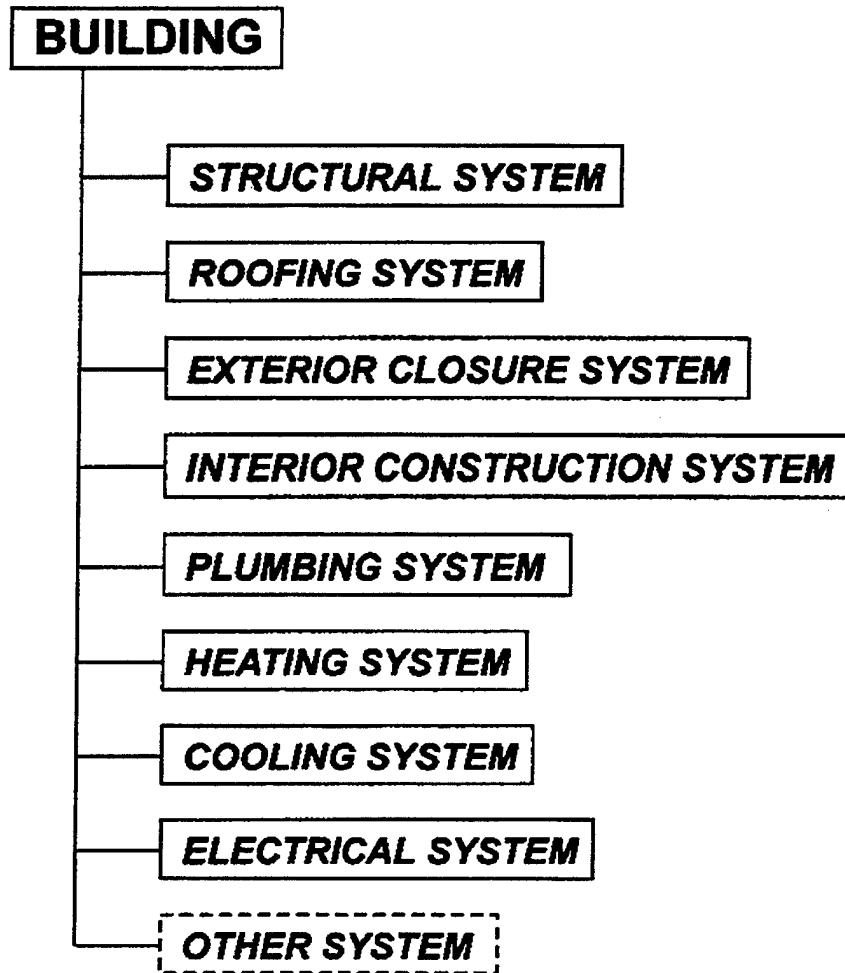
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Appendix A: Division of Building Systems

A historic building represents a flow of events within its walls throughout time. Each element within the building can contribute to its historic nature. Historic building materials are those materials used in construction that contribute to the historic character of the building. Most historic buildings probably have undergone some changes over their existence. When a historic building is laid away, the intention is to retain and preserve as much of its historic character as possible.

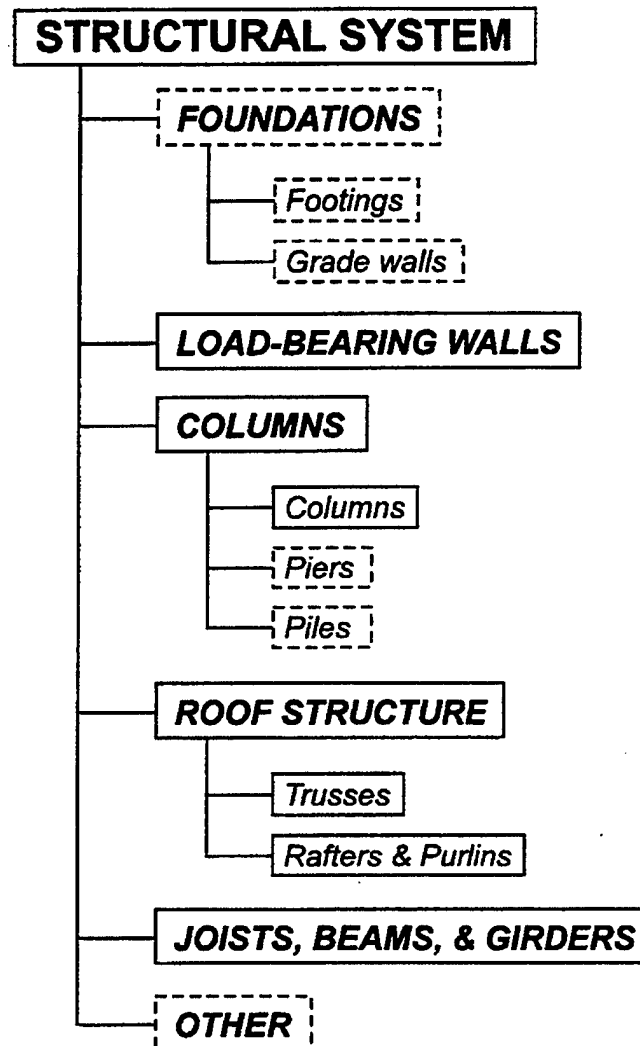
Because this report offers interim findings on how to lay away a historic building, and because a building is made of many different materials, this report does not offer comprehensive guidance. The figures in this appendix divide a building into systems, components, subcomponents, and material types. Each figure shows whether this report includes a checklist for that item. A solid box around the item indicates that the appendixes contain a relevant checklist. An item surrounded by a box made of broken lines indicates that no checklist has been developed for the item. The available checklists are in Appendixes C through J.



 Component(s) and subcomponent(s) in system do not have specific checklists.

 Component(s) and subcomponent(s) in system may have specific checklists; see specific system for details.

Figure A1. Building systems.



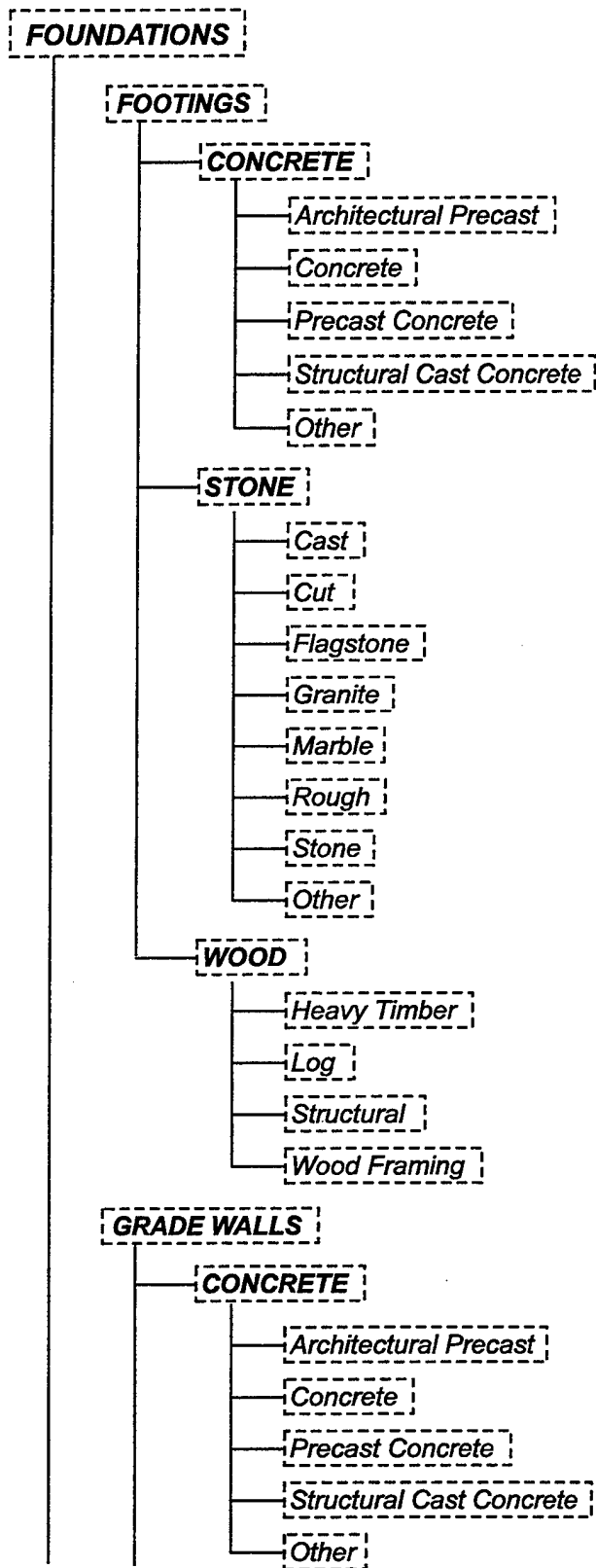
NOTE: All components and subcomponents in this system may have a finish applied to them.

 Component(s) and subcomponent(s) do not have specific checklists.

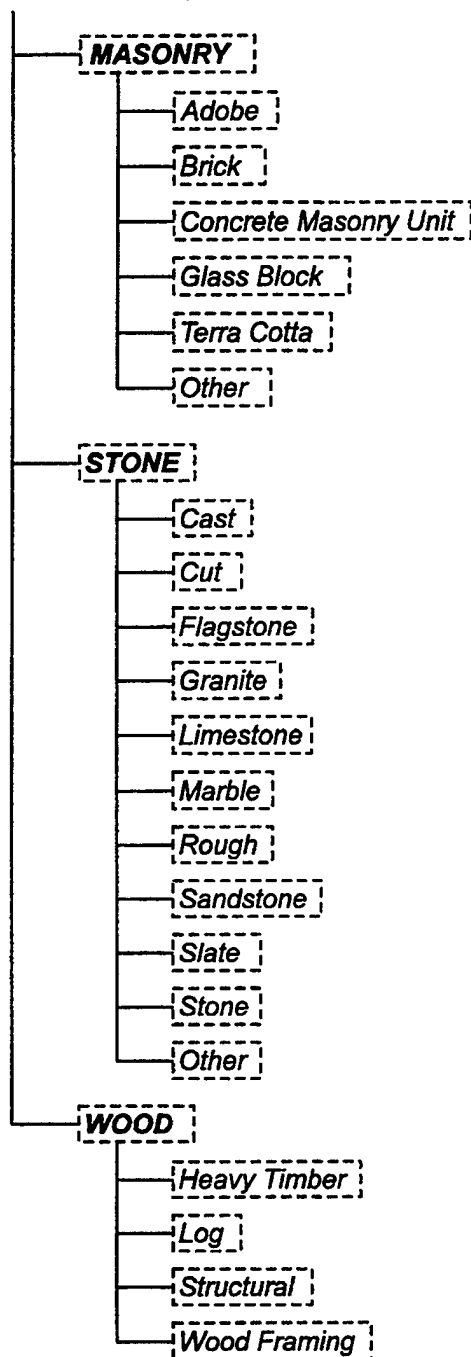
 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A2. Components and subcomponents of Structural System.

STRUCTURAL SYSTEM



Continued next page

FOUNDATIONS (cont'd)

NOTE: All components and subcomponents in this system may have a finish applied to them.

 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A3. Subcomponents and materials of foundations.

STRUCTURAL SYSTEM

LOAD-BEARING WALLS

CONCRETE

- Architectural Precast
- Concrete
- Precast Concrete
- Structural Cast Concrete
- Other

MASONRY

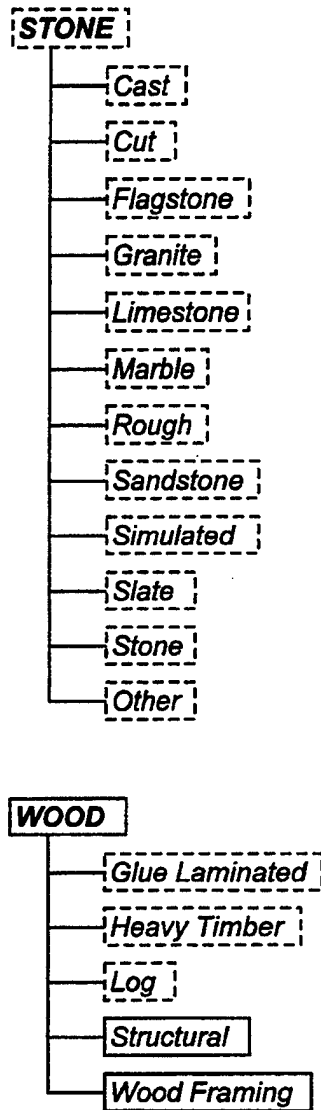
- Adobe
- Brick
- Concrete Masonry Unit
- Glass Block
- Gypsum
- Terra Cotta
- Other

METAL

- Aluminum
- Iron
- Steel
- Structural Steel

Continued next page

LOAD-BEARING WALLS



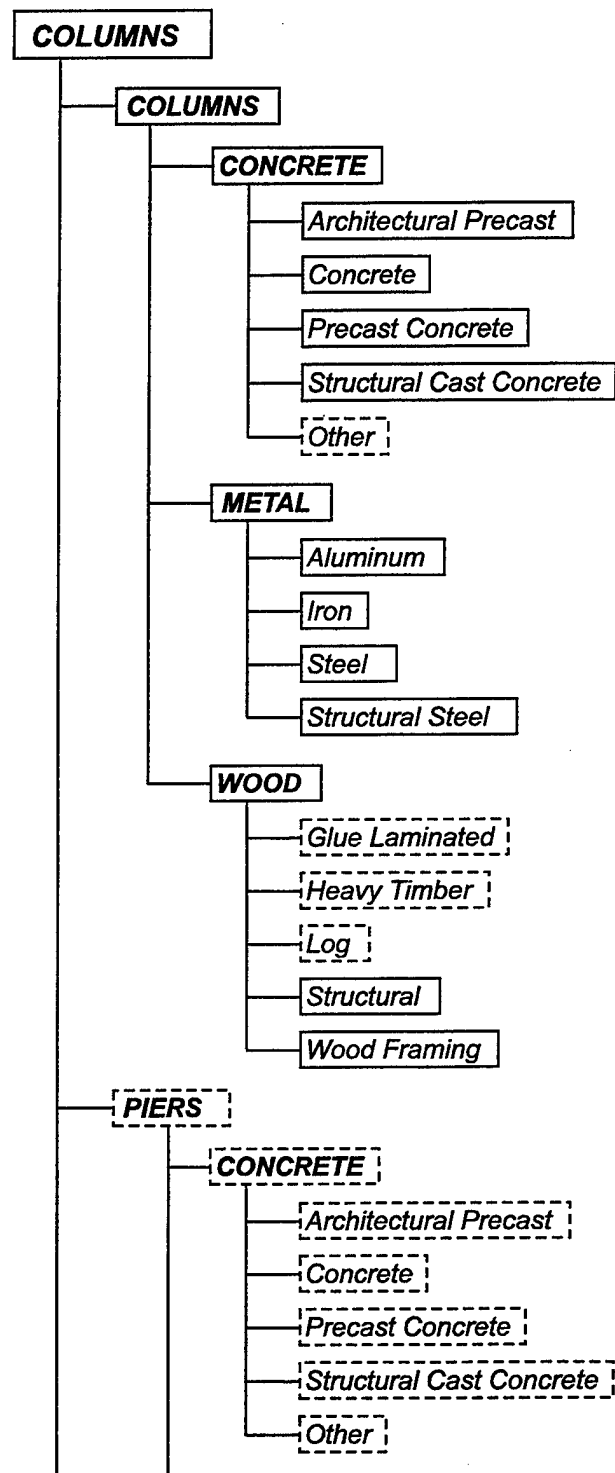
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 Component(s) and subcomponent(s) do not have specific checklists.

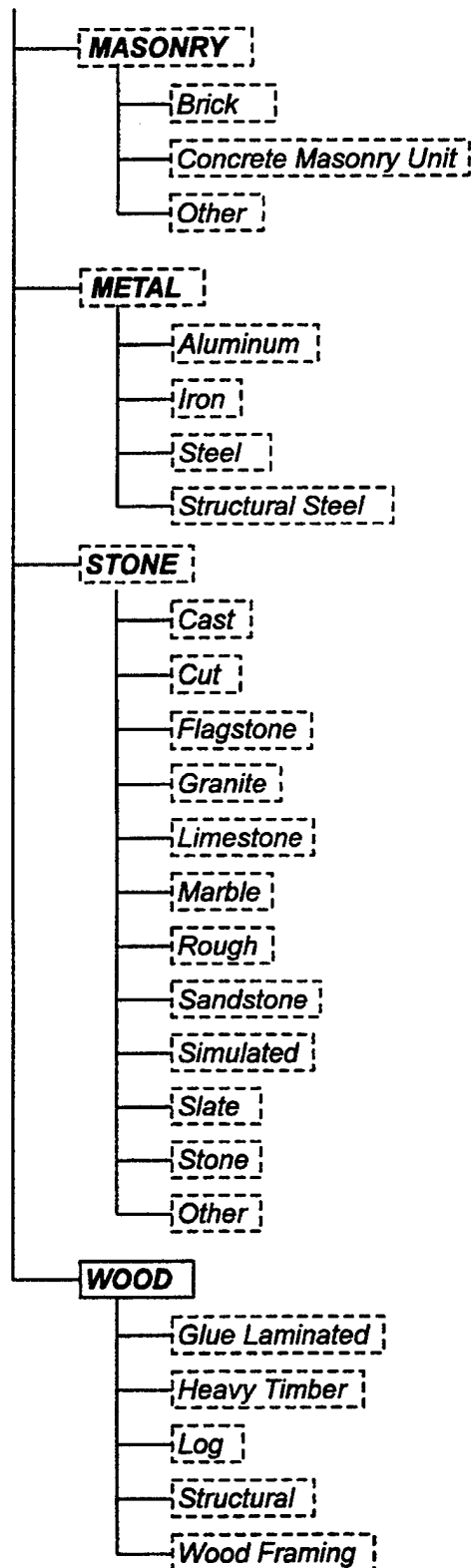
 Component(s) and subcomponent(s) may have specific checklists;
see specific component and subcomponent for details.

Figure A4. Subcomponents and materials of load-bearing walls.

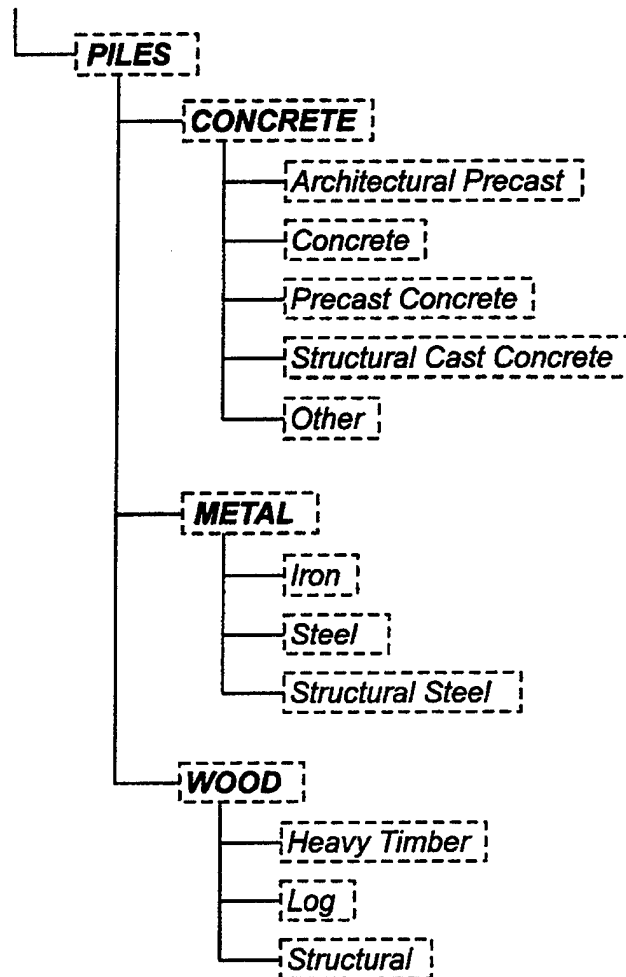
STRUCTURAL SYSTEM



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COLUMNS (cont'd)

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COLUMNS (cont'd)

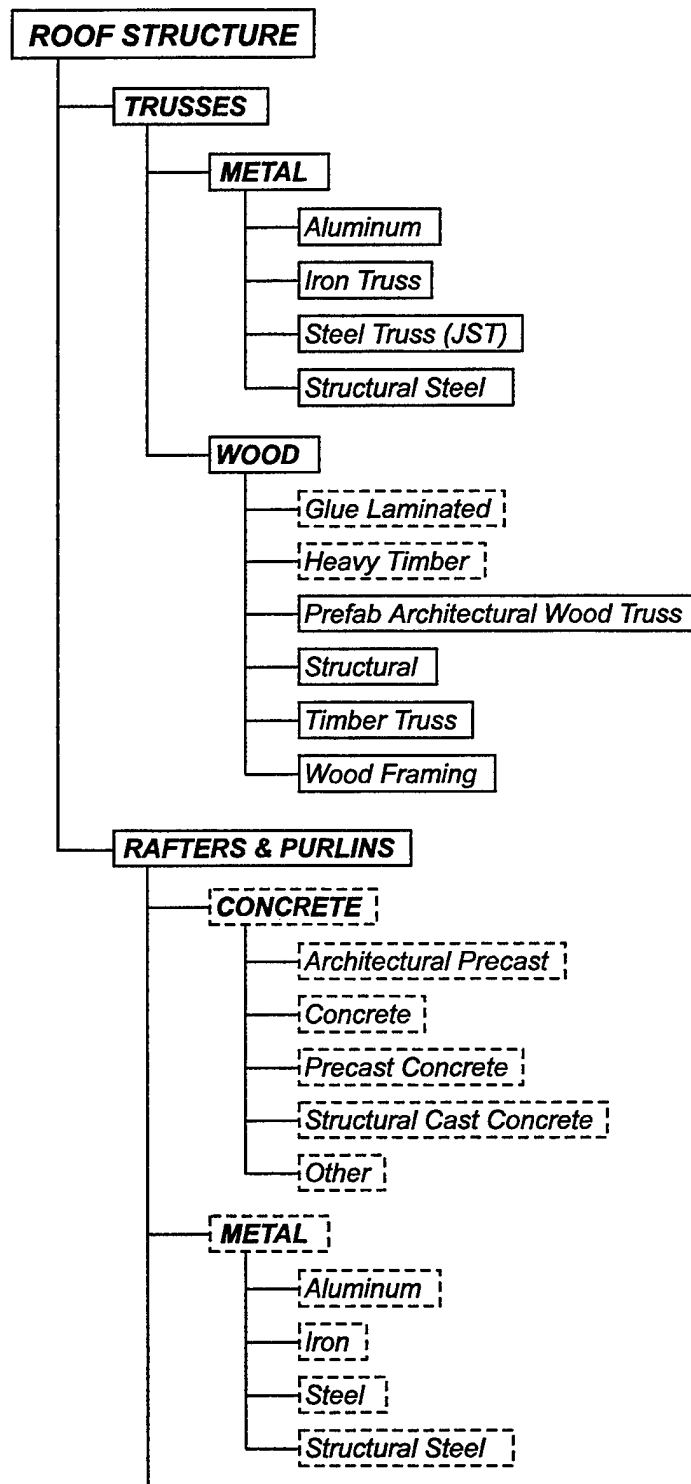
NOTE: All components and subcomponents in this system may have a finish applied to them.

 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

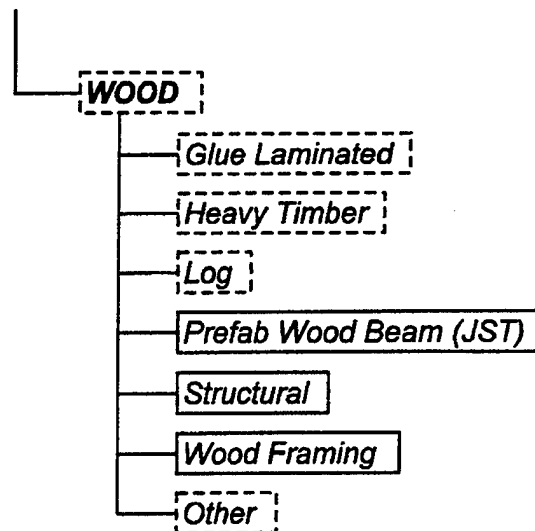
Figure A5. Subcomponents and materials of columns.

STRUCTURAL SYSTEM



Continued next page

ROOF STRUCTURE (cont'd)



NOTE: All components and subcomponents in this system may have a finish applied to them.

 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A6. Subcomponents and materials of roof structure.

STRUCTURAL SYSTEM

JOINTS, BEAMS, & GIRDERS

CONCRETE

Architectural Precast

Concrete

Precast Concrete

Structural Cast Concrete

Other

MASONRY

Concrete Masonry Unit

Other

METAL

Iron

Steel

Structural Steel

Other

WOOD

Glue Laminated

Heavy Timber

Log

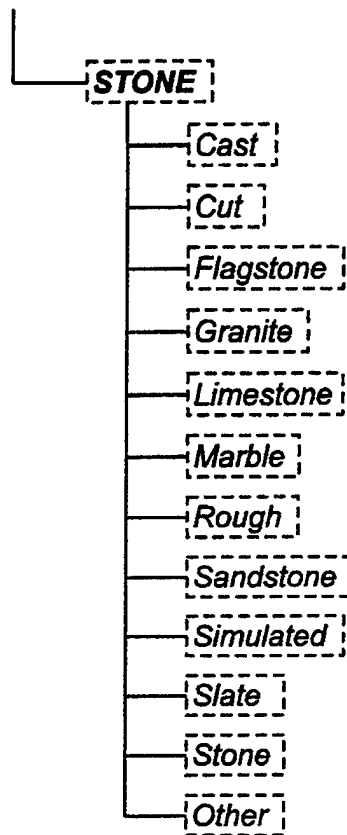
Prefab Wood Beam (JST)

Structural

Wood Framing

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JOINTS, BEAMS, & GIRDERS (cont'd)

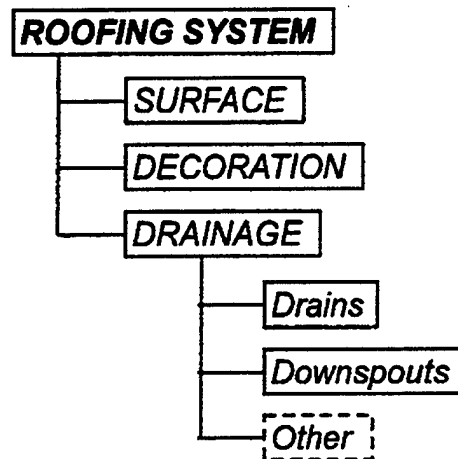


NOTE: All components and subcomponents in this system may have a finish applied to them.

 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A7. Materials of joists, beams, and girders.



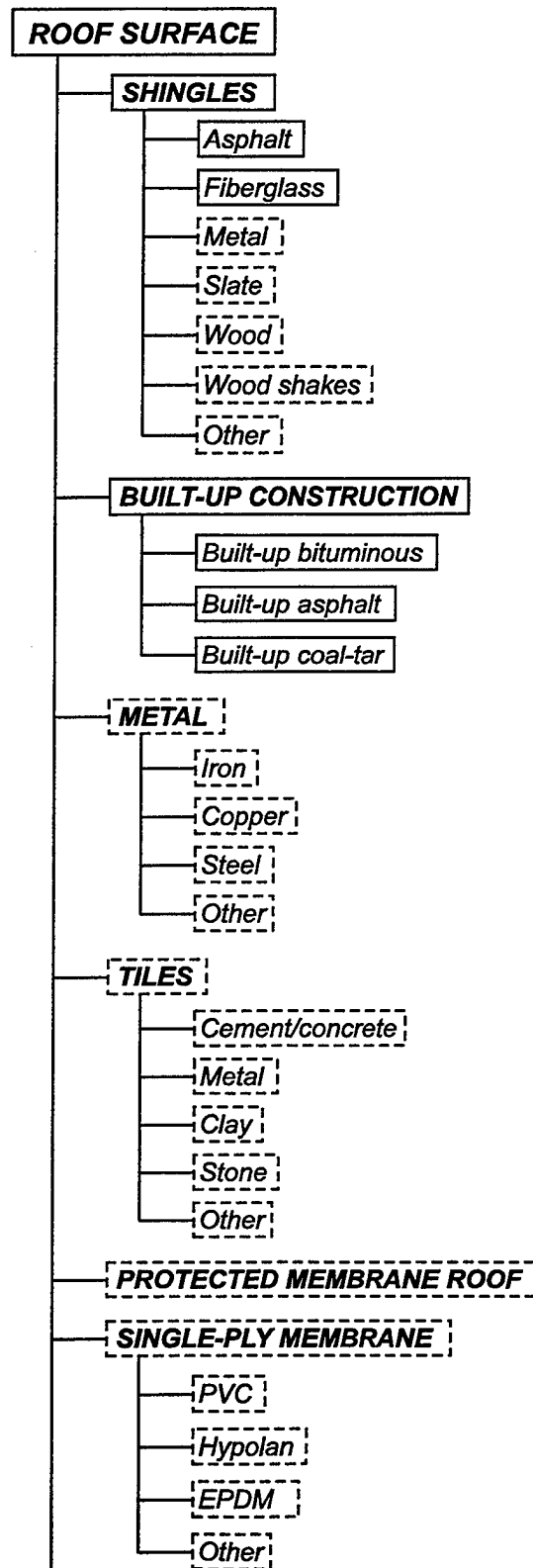
NOTE: All components in this system may have a finish.

 Components in the system do not have specific checklists.

 Components in system may have specific checklists;
see specific component for details.

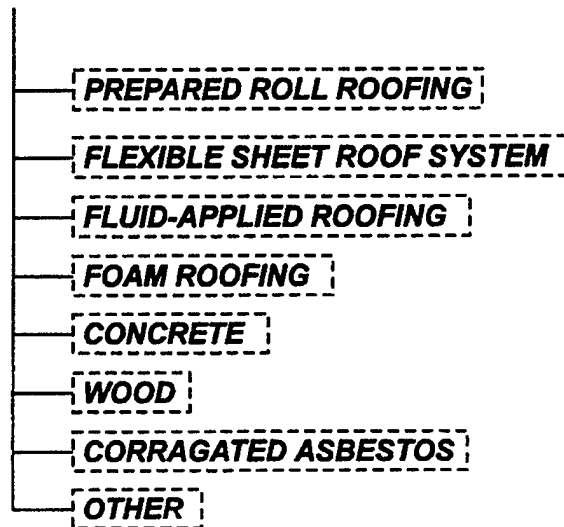
Figure A8. Components and subcomponents of roofing system.

ROOFING SYSTEM



Continued next page

ROOFING SYSTEM (cont'd)



NOTE: Materials may have a finish applied to them.

☐ Materials that do not have specific checklists.

☐ Materials that have specific checklists.

Figure A9. Subcomponents and materials of roof surface.

ROOFING SYSTEM

ROOF DECORATION

TRIM/FLASHING

METAL

Sheet Metal

Copper

Lead

Steel

LAMINATED SHEET

ELASTO/PLASTO

PLASTIC

RUBBER SHEET

CONCRETE

GYPSUM

STONE

Cut Stone

Marble

Limestone

Granite

Sandstone

WOOD

OTHER

CORNICE/SOFFIT

METAL

Copper

Sheet Metal

Aluminum

CONCRETE

GYPSUM

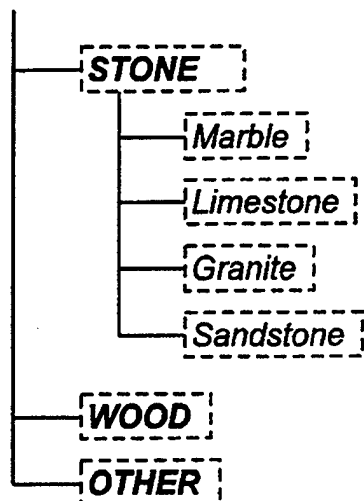
MASONRY

Terra Cotta

Brick

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ROOFING SYSTEM (cont'd)



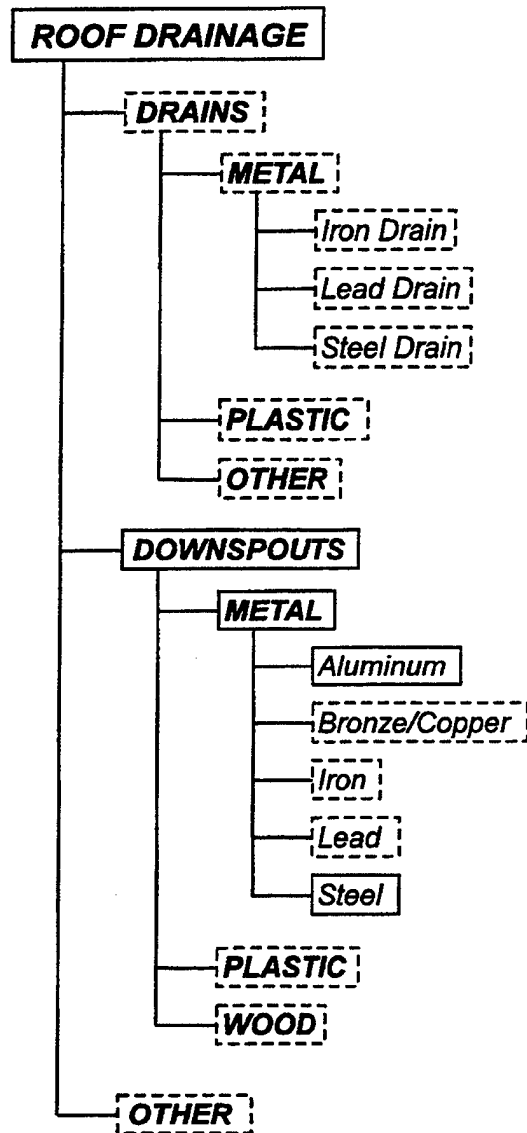
NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A10. Subcomponents and materials of roof decoration.

ROOFING SYSTEM

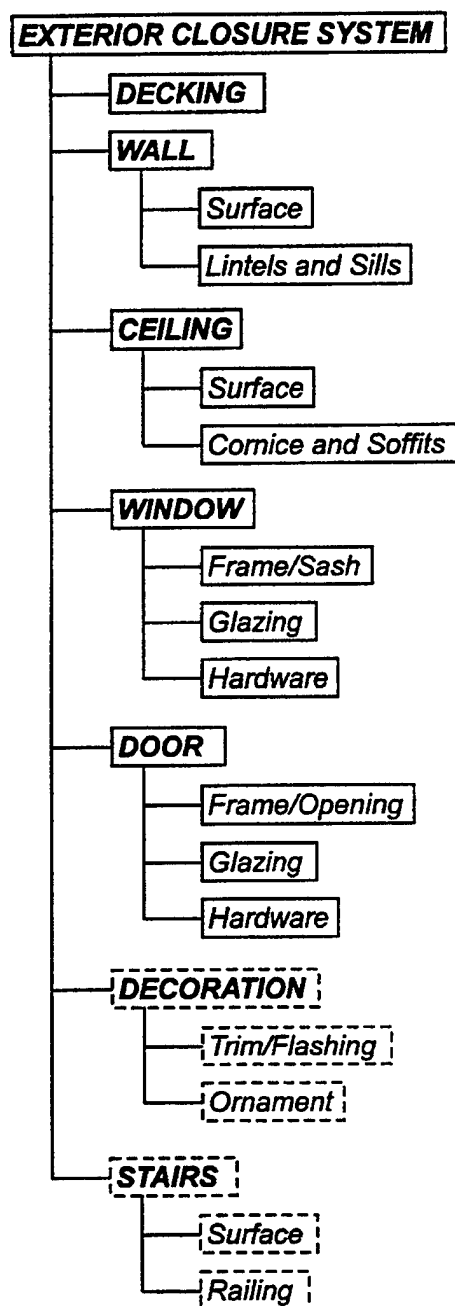


NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A11. Subcomponents and materials of roof drainage.



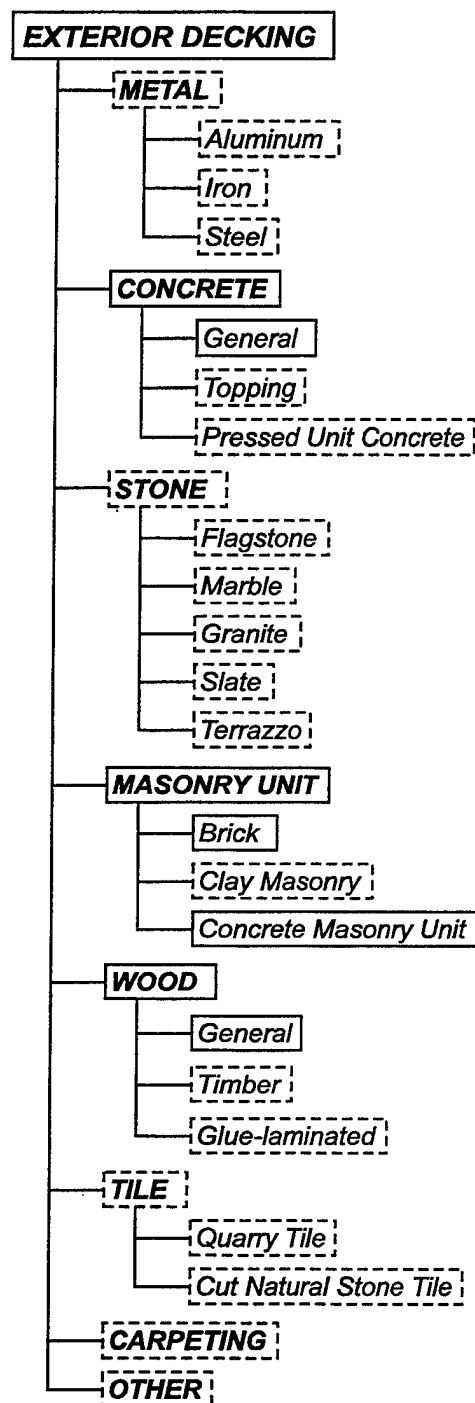
NOTE: All components in this system may have a finish applied to them.

 Components and subsystems do not have specific checklists.

 Components and subcomponents may have specific checklists; see specific system for details.

Figure A12. Components and subcomponents of exterior closure system.

EXTERIOR CLOSURE SYSTEM



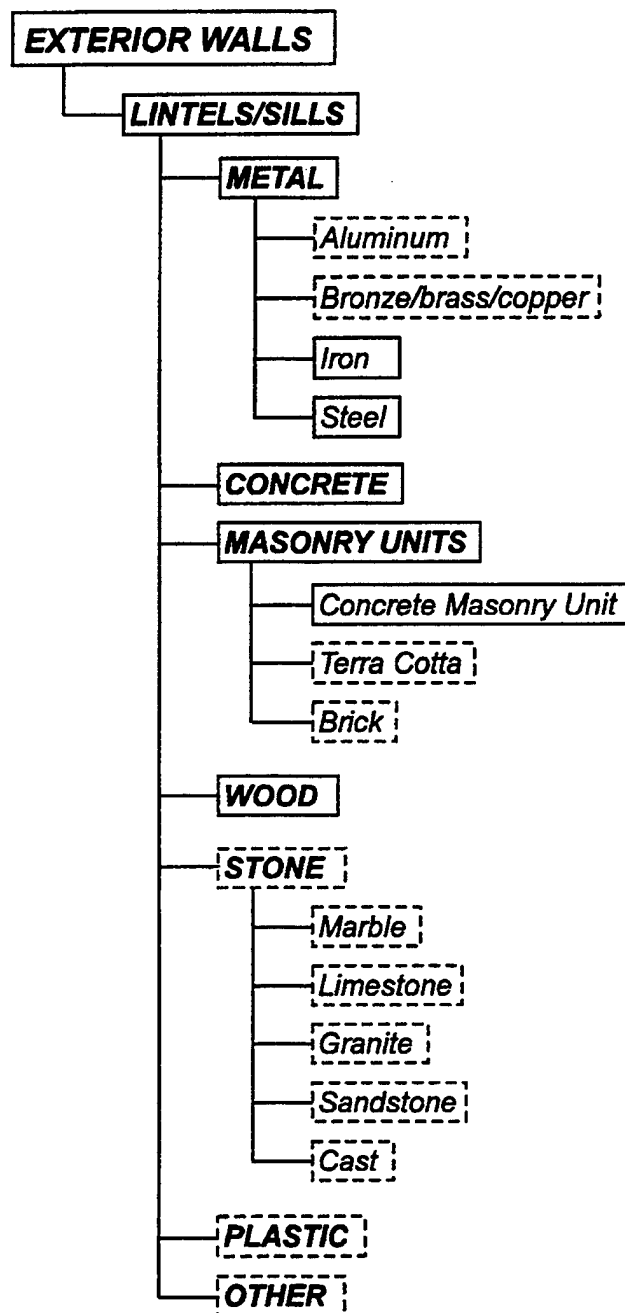
NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A13. Subcomponents and materials of exterior decking.

EXTERIOR CLOSURE SYSTEM



NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A14. Subcomponents and materials of exterior lintels and sills.

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALLS

SURFACES

CONCRETE

- Pre-cast
- Poured in place
- Concrete finish
- Blasted concrete finish
- Colored concrete finish
- Grooved surface concrete

PLASTER

- Veneer plaster base
- Gypsum plaster
- Veneer plaster
- Portland cement plaster
- Adobe finish

MASONRY UNITS

- Clay unit masonry
- Brick
- Glass block
- Gypsum unit masonry
- Adobe unit masonry
- Terra cotta masonry

PLASTIC

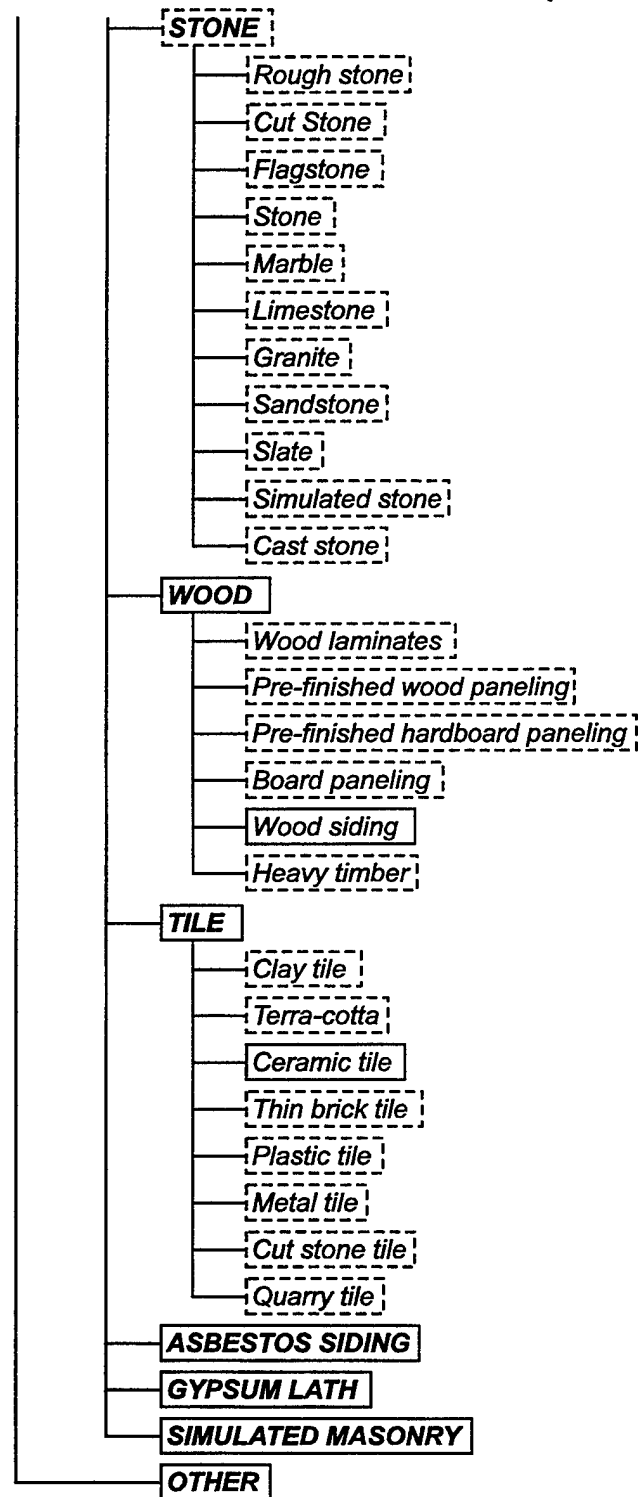
- Plastic laminates
- Vinyl siding

METAL

- Iron
- Aluminum
- Steel
- Metallic laminates
- Aluminum siding
- Metal lath
- Sheet lath

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EXTERIOR CLOSURE SYSTEM (cont'd)



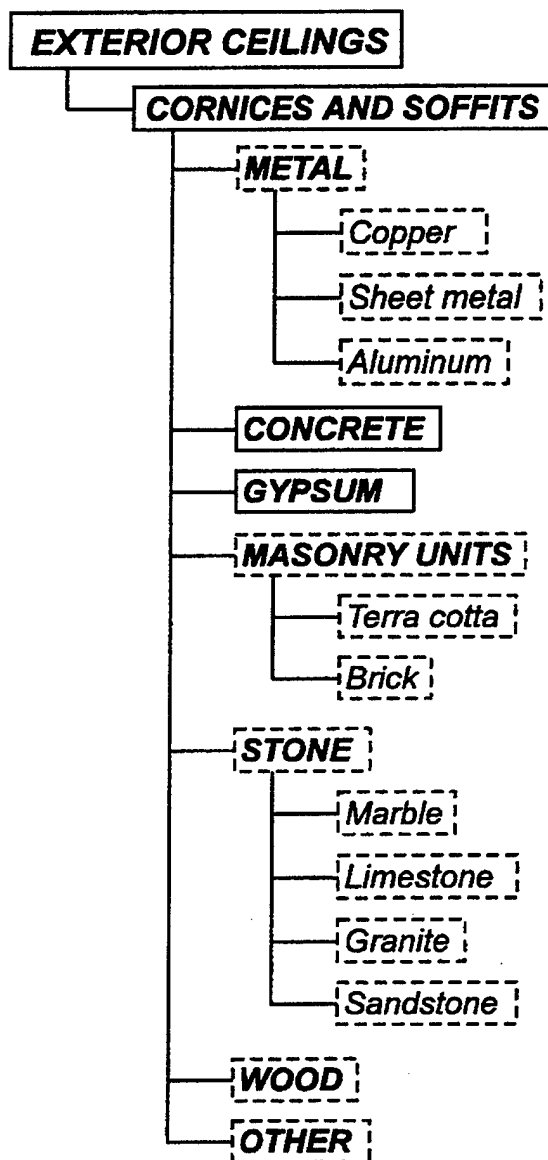
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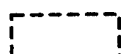
 Materials that have specific checklists.

Figure A15. Subcomponents and materials of exterior wall surface.

EXTERIOR CLOSURE SYSTEM



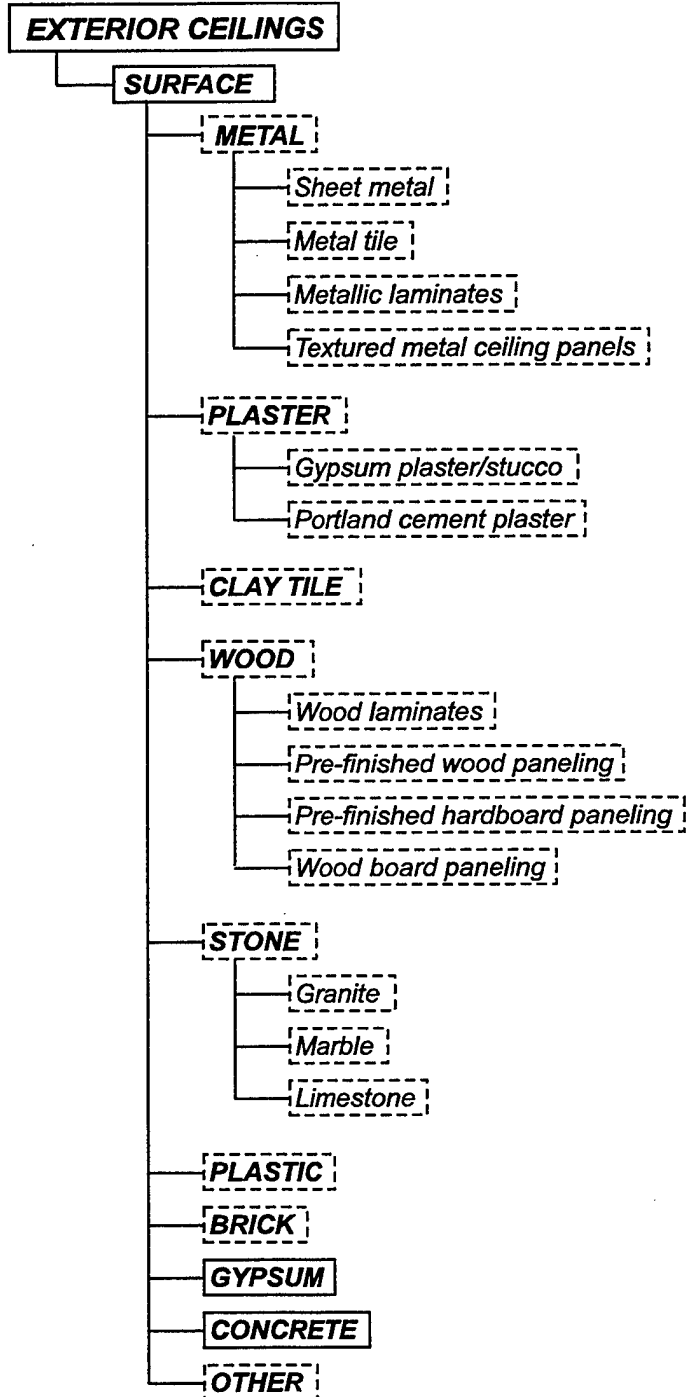
NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A16. Subcomponents and materials of exterior cornices and soffits.

EXTERIOR CLOSURE SYSTEM



NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A17. Subcomponents and materials of exterior ceiling surfaces.

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS

FRAME/SASH

METAL

Aluminum

Iron

Bronze/brass/copper

Steel

Stainless steel

Galvanized steel

PLASTIC/PVC

WOOD

OTHER

GLAZING

GENERAL

FLOAT

LAMINATED

INSULATING

MIRRORED

WIRE

BENT

PATTERNED

BEVELLED

LEADED

STAINED

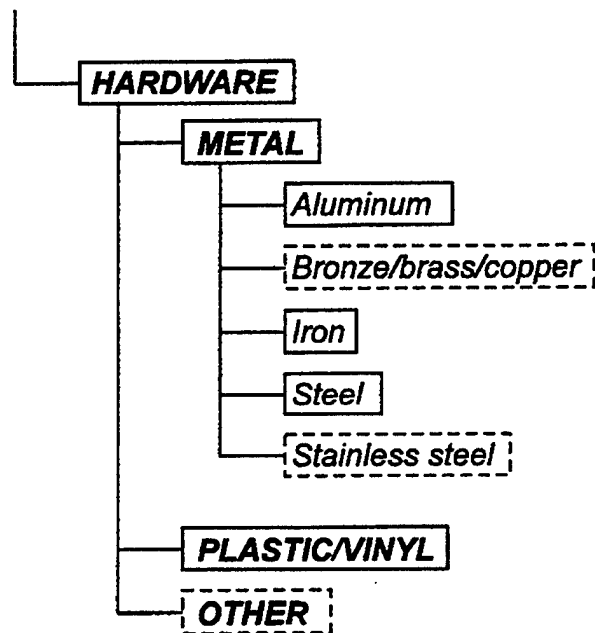
PLASTIC

LEXAN

OTHER

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EXTERIOR CLOSURE SYSTEM (cont'd)



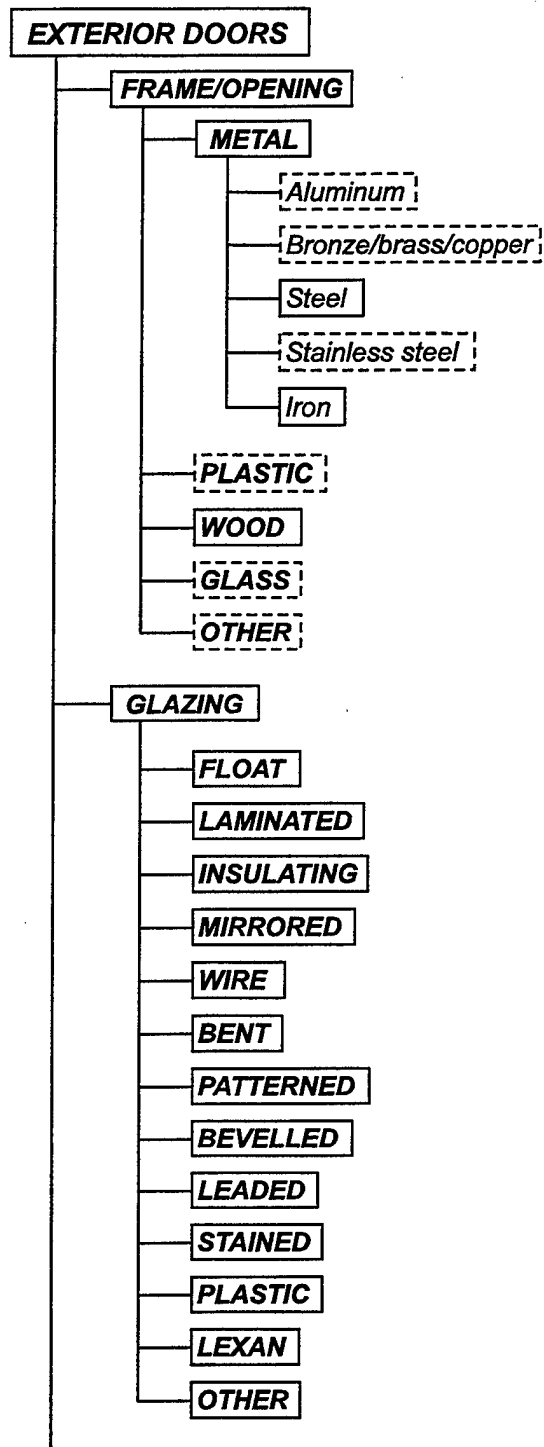
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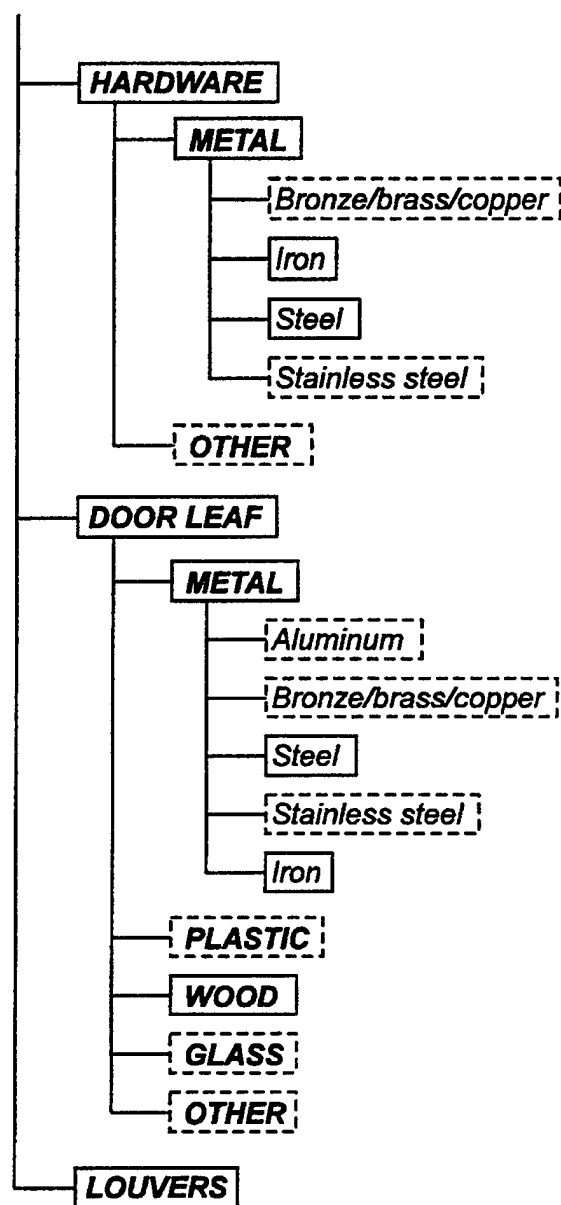
Figure A18. Subcomponents and materials of exterior windows.

EXTERIOR CLOSURE SYSTEM



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EXTERIOR CLOSURE SYSTEM (cont'd)



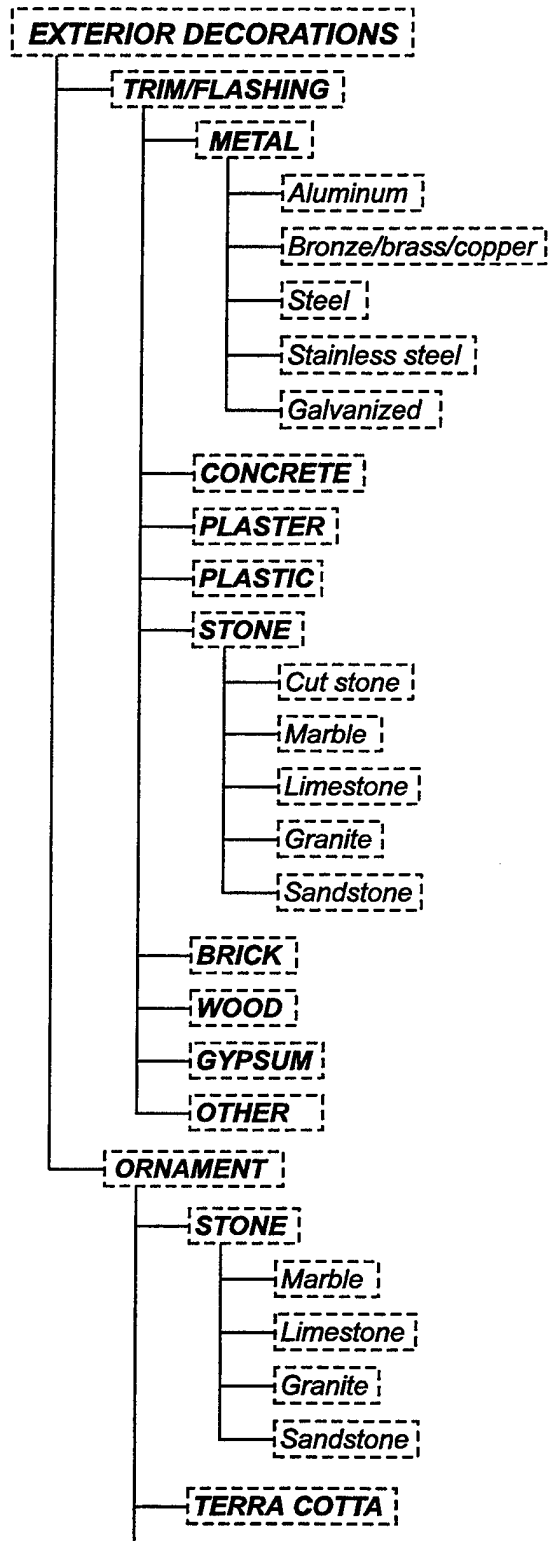
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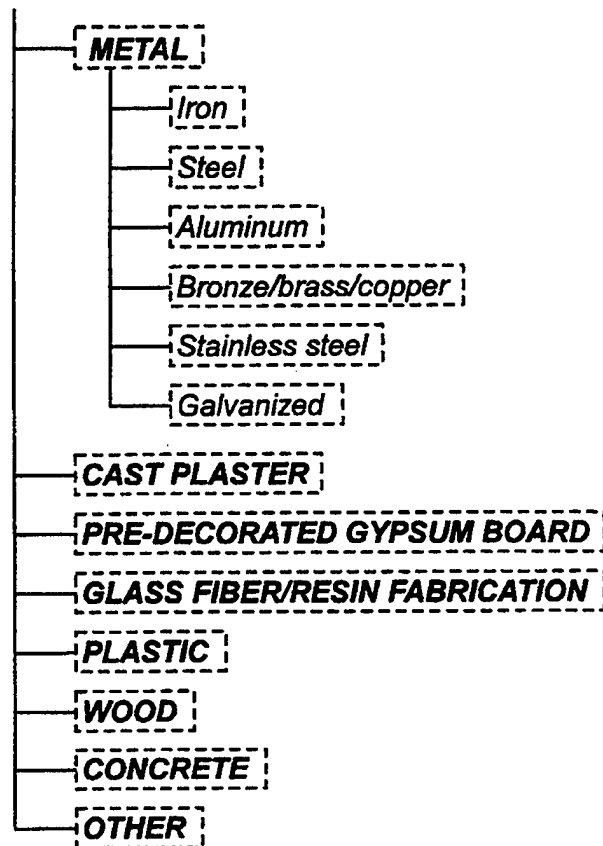
Figure A19. Subcomponents and materials of exterior doors.

EXTERIOR CLOSURE SYSTEM



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EXTERIOR CLOSURE SYSTEM (cont'd)



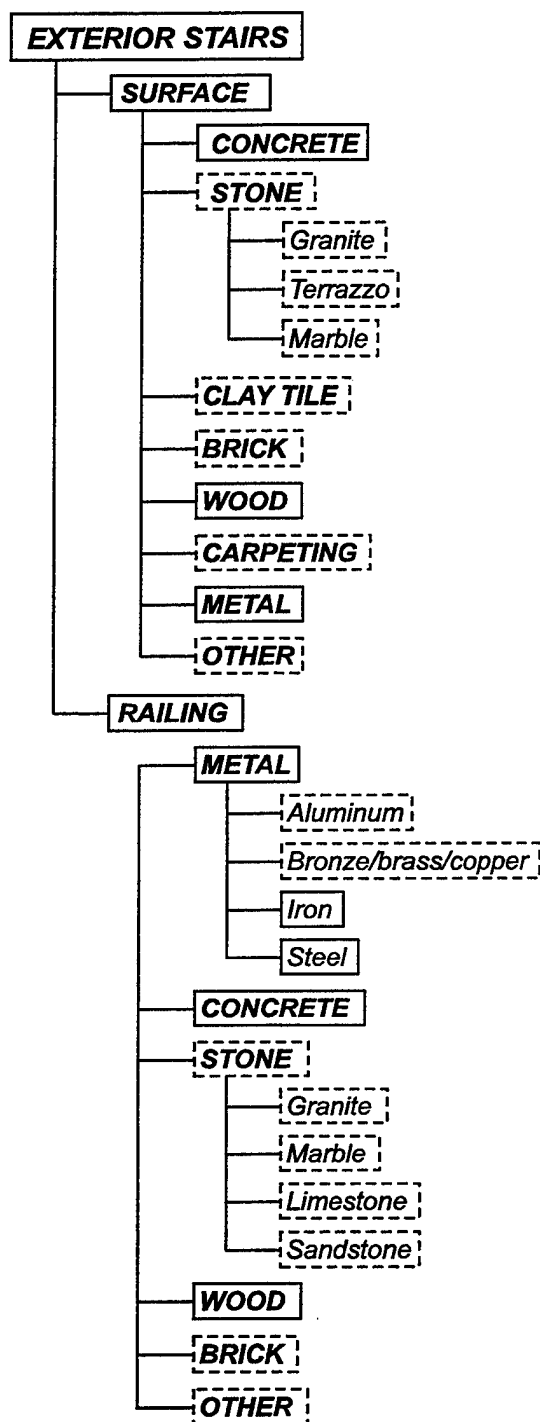
NOTE: Materials may have a finish applied to them.

☐ Materials that do not have specific checklists.

☐ Materials that have specific checklists.

Figure A20. Subcomponents and materials of exterior decorations.

EXTERIOR CLOSURE SYSTEM

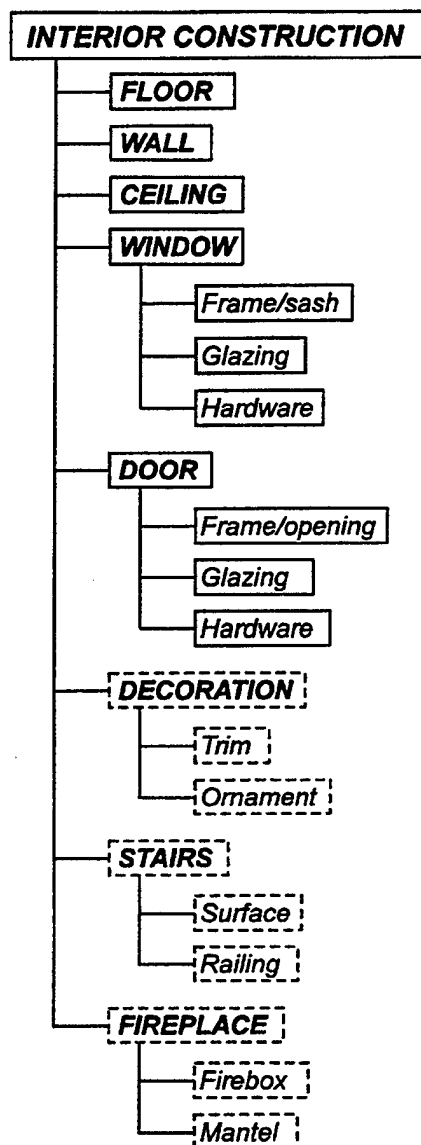


NOTE: Materials may have a finish applied to them.

Materials that do not have specific checklists.

Materials that have specific checklists.

Figure A21. Subcomponents and materials of exterior stairs.



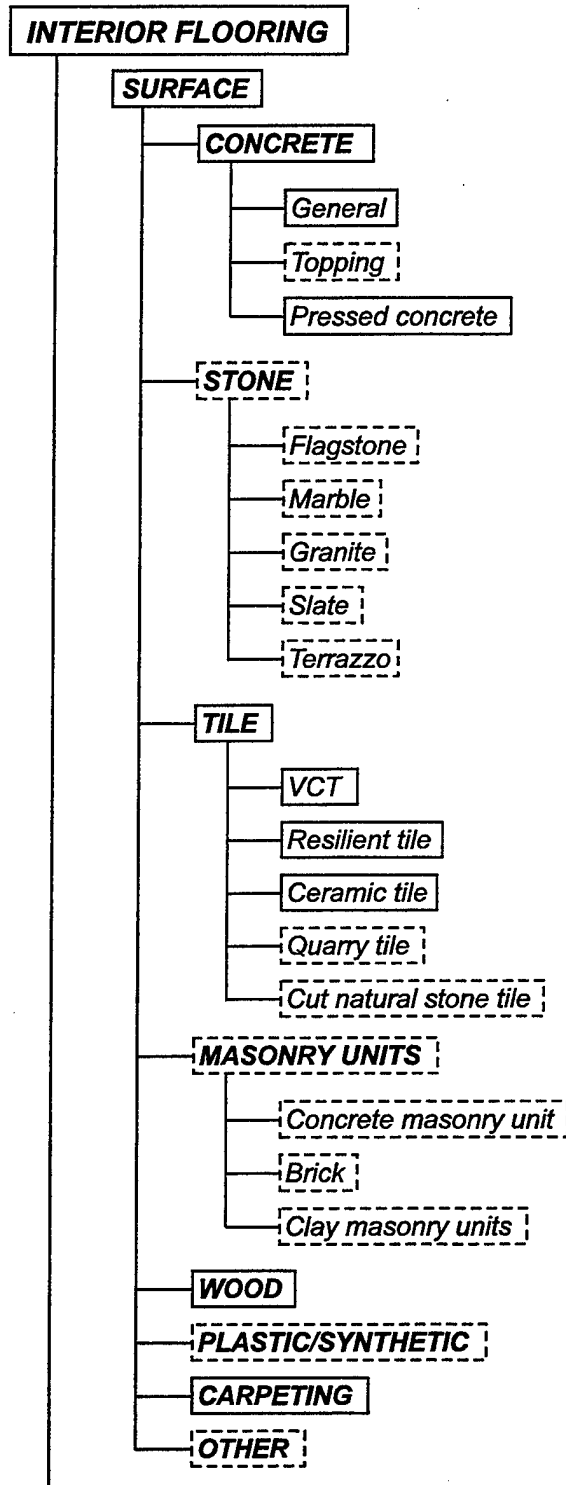
NOTE: All components and subcomponents in this system may have a finish applied to them.

 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component for details.

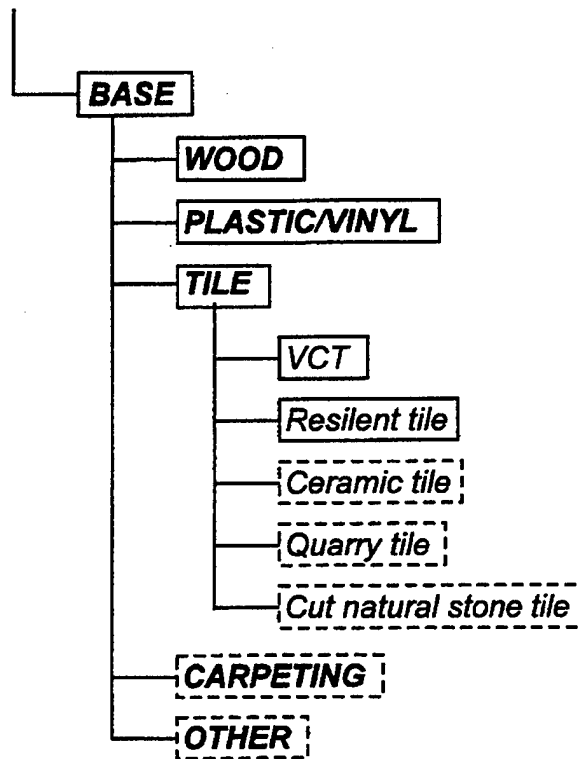
Figure A22. Components and subcomponents of interior closure system.

INTERIOR CONSTRUCTION SYSTEM



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INTERIOR CONSTRUCTION SYSTEM (cont'd)



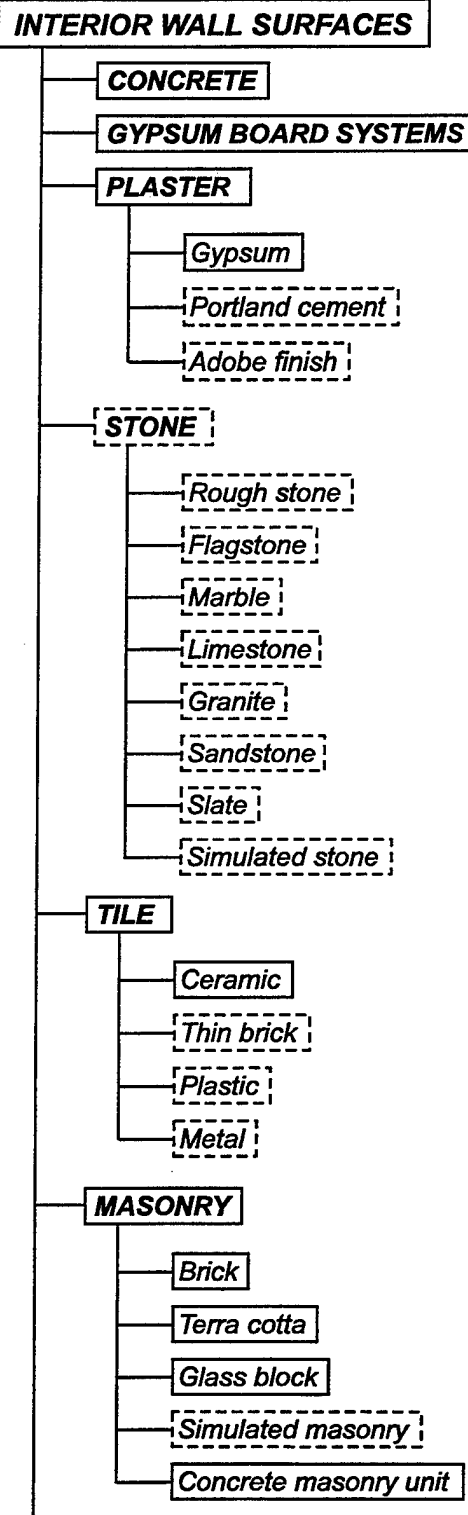
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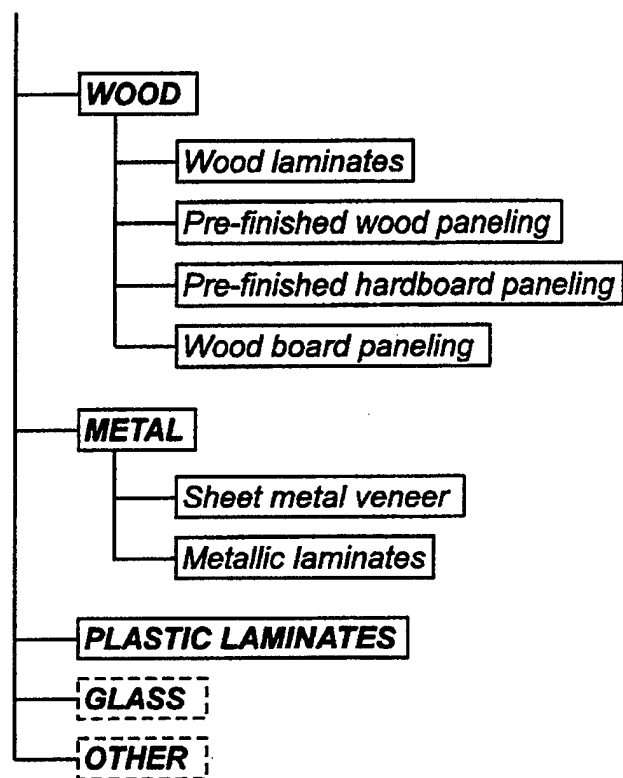
 Materials that have specific checklists.

Figure A23. Subcomponents and materials of interior flooring.

INTERIOR CONSTRUCTION SYSTEM



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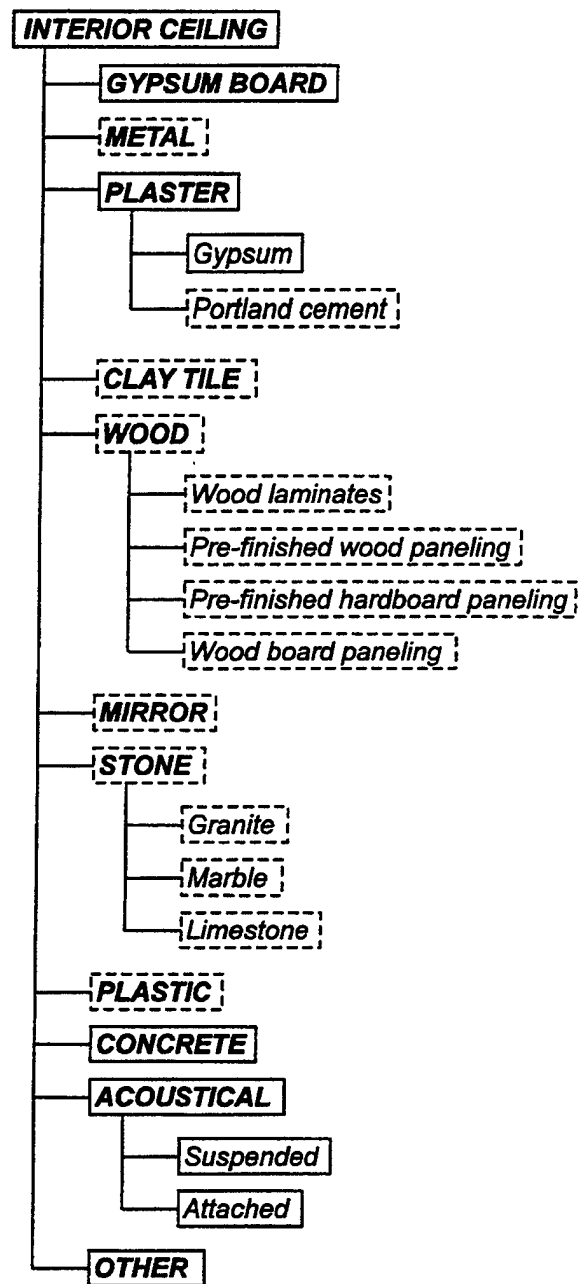
NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A24. Subcomponents and materials of interior walls.

INTERIOR CONSTRUCTION SYSTEM



NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A25. Subcomponents and materials of interior ceilings.

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WINDOWS

FRAME/SASH

METAL

Aluminum

Iron

Bronze/brass/copper

Steel

Stainless steel

Galvanized

PLASTIC/PVC

WOOD

OTHER

GLAZING

GENERAL

FLOAT

LAMINATED

INSULATING

MIRRORED

WIRE

BENT

PATTERNED

BEVELLED

LEADED

STAINED

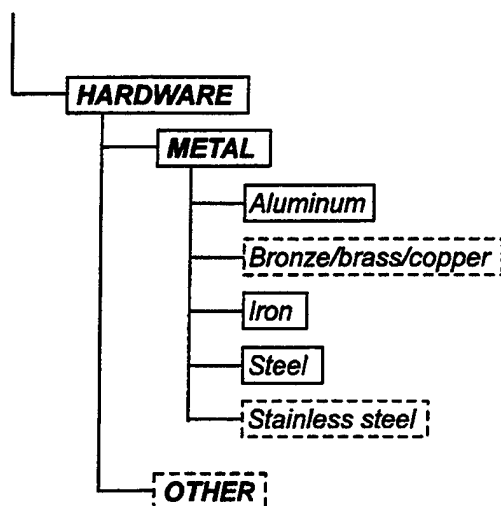
PLASTIC

LEXAN

OTHER

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INTERIOR CONSTRUCTION SYSTEM (cont'd)



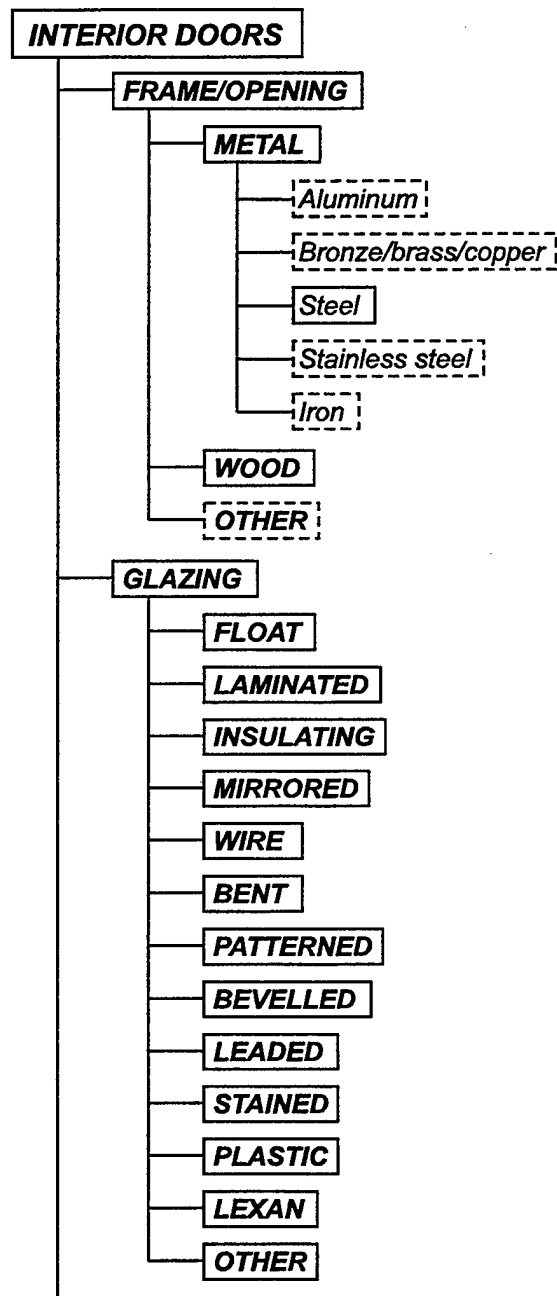
NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

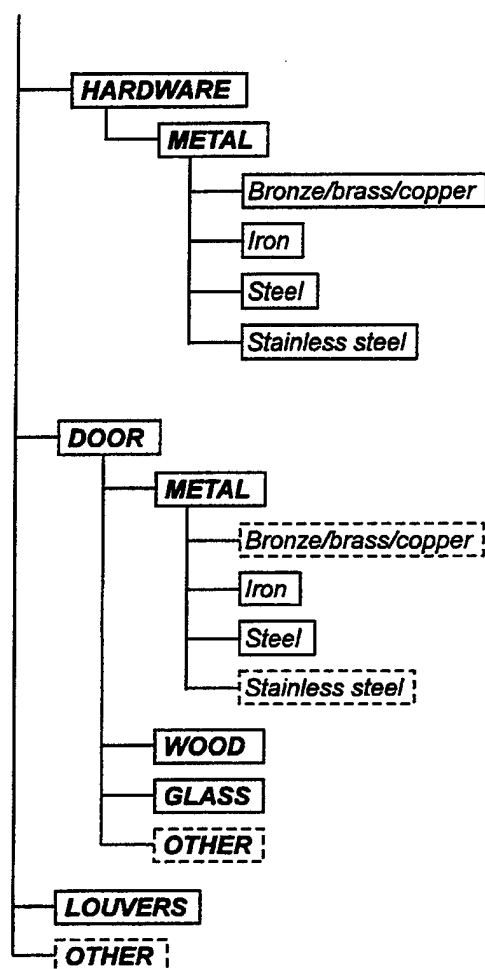
Figure A26. Subcomponents and materials of interior windows.

INTERIOR CONSTRUCTION SYSTEM



Continued next page

INTERIOR CONSTRUCTION SYSTEM (cont'd)



NOTE: Materials may have a finish applied to them.

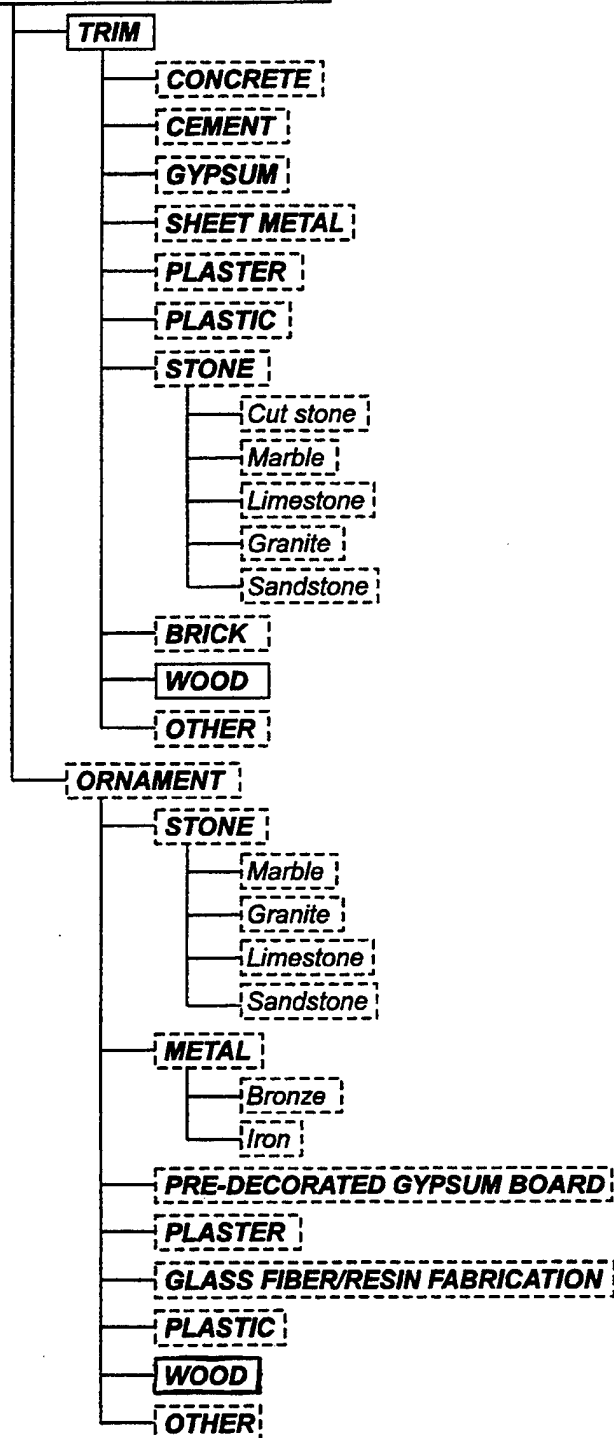
 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A27. Subcomponents and materials of interior doors.

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DECORATION



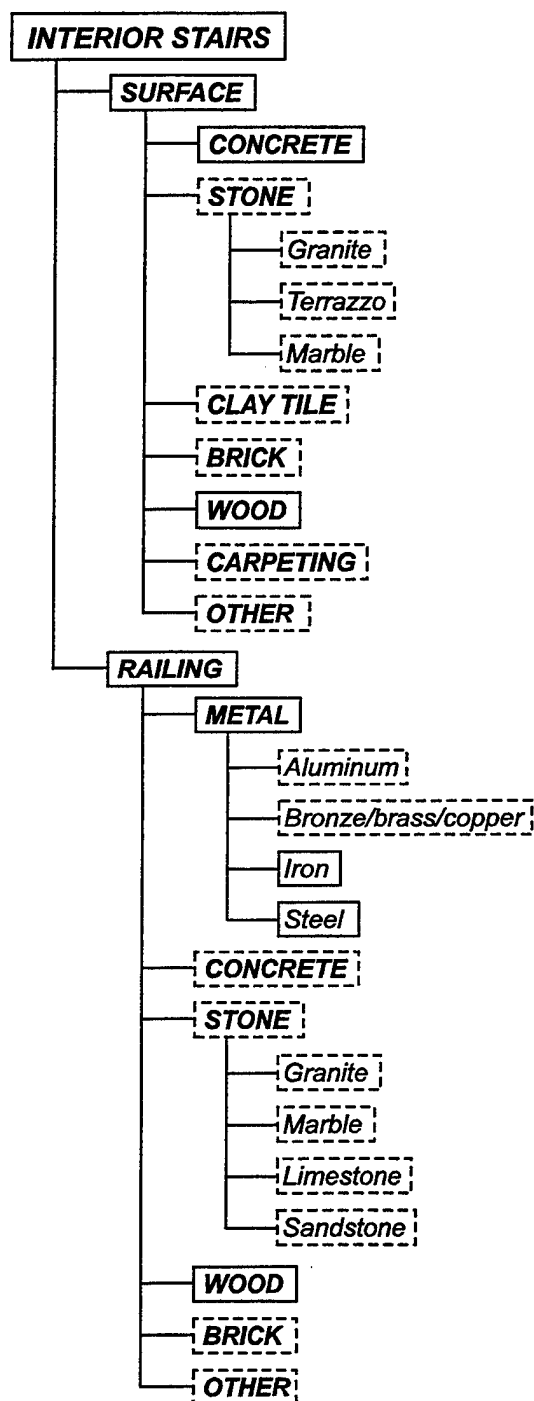
NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A28. Subcomponents and materials of interior decorations.

INTERIOR CONSTRUCTION SYSTEM



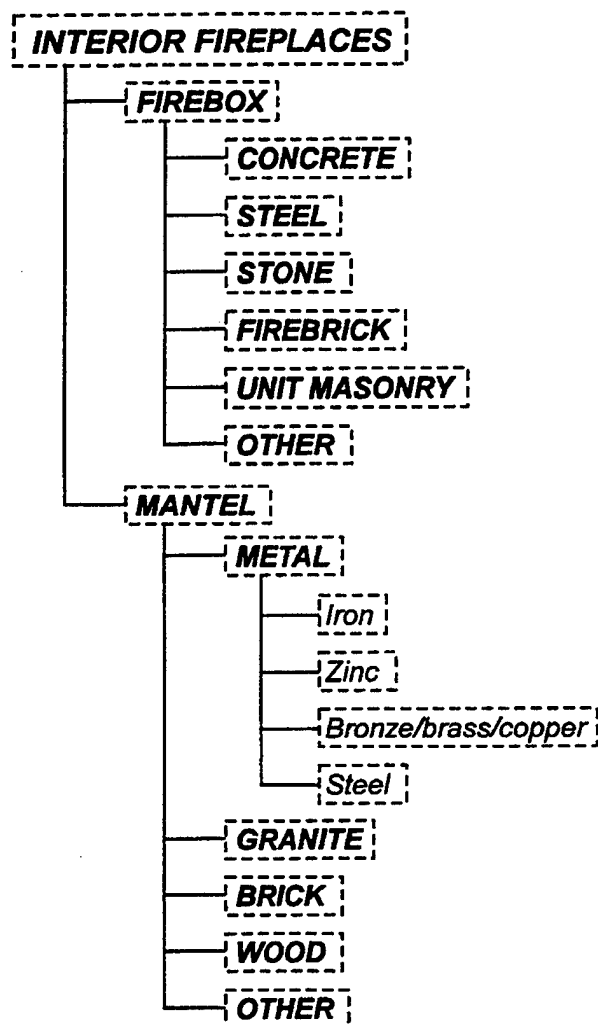
NOTE: Materials may have a finish applied to them.

 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A29. Subcomponents and materials of interior stairs.

INTERIOR CONSTRUCTION SYSTEM

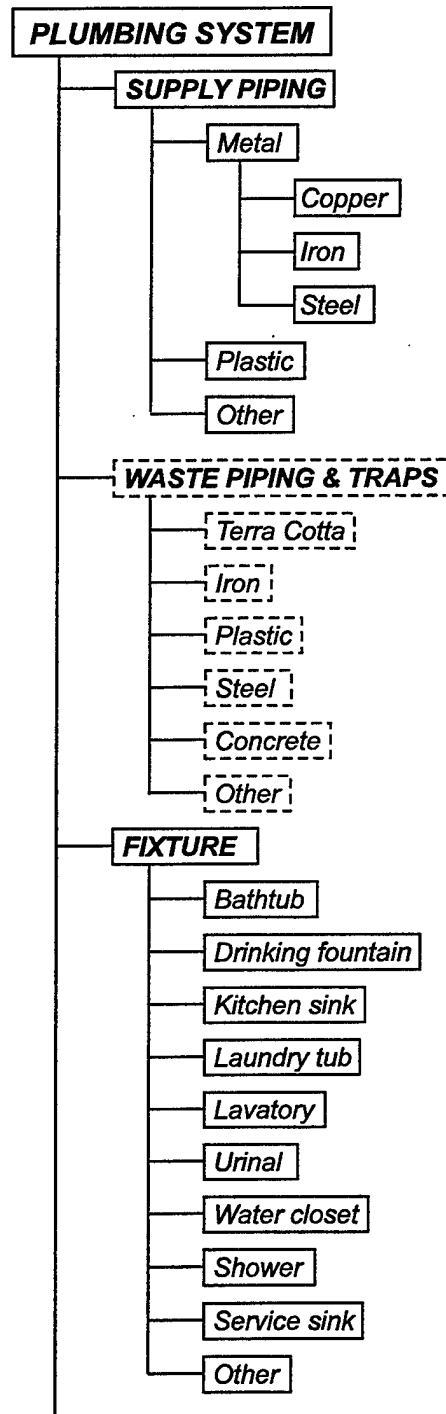


NOTE: Materials may have a finish applied to them.

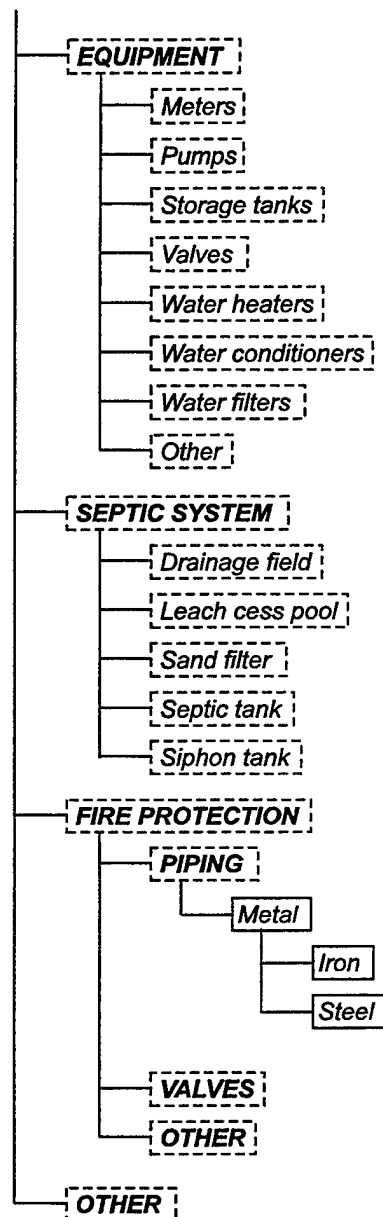
 Materials that do not have specific checklists.

 Materials that have specific checklists.

Figure A30. Subcomponents and materials of interior fireplaces.



Continued next page

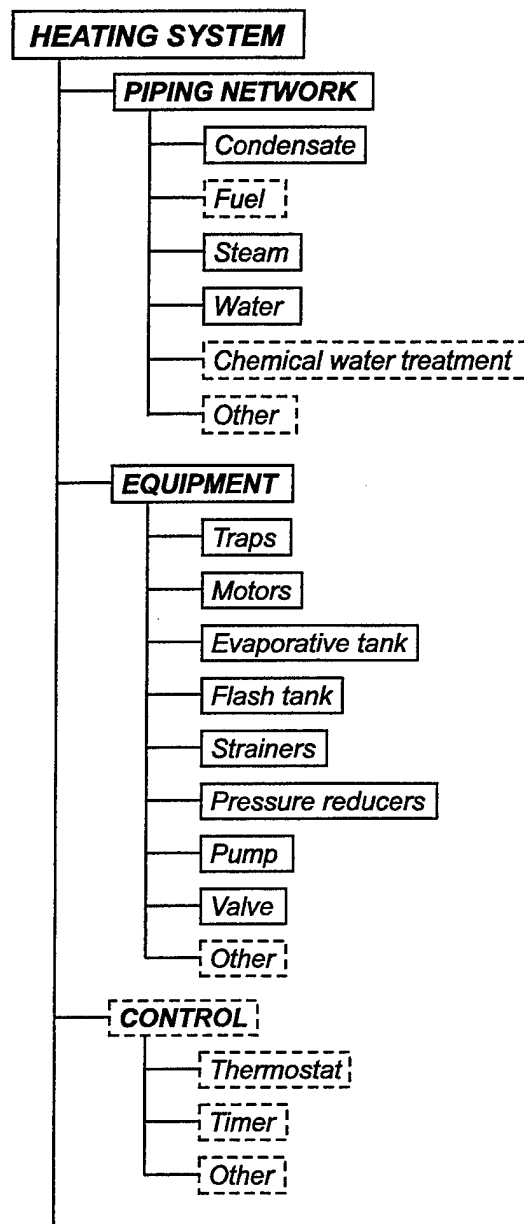


NOTE: All components and subcomponents in this system may have a finish applied to them.

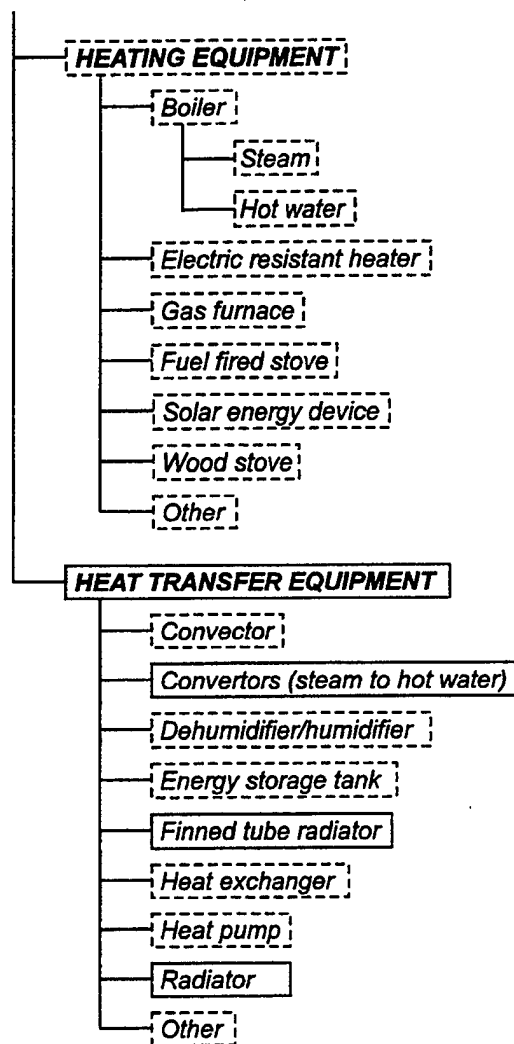
 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A31. Components, subcomponents, and materials of plumbing system.



Continued next page

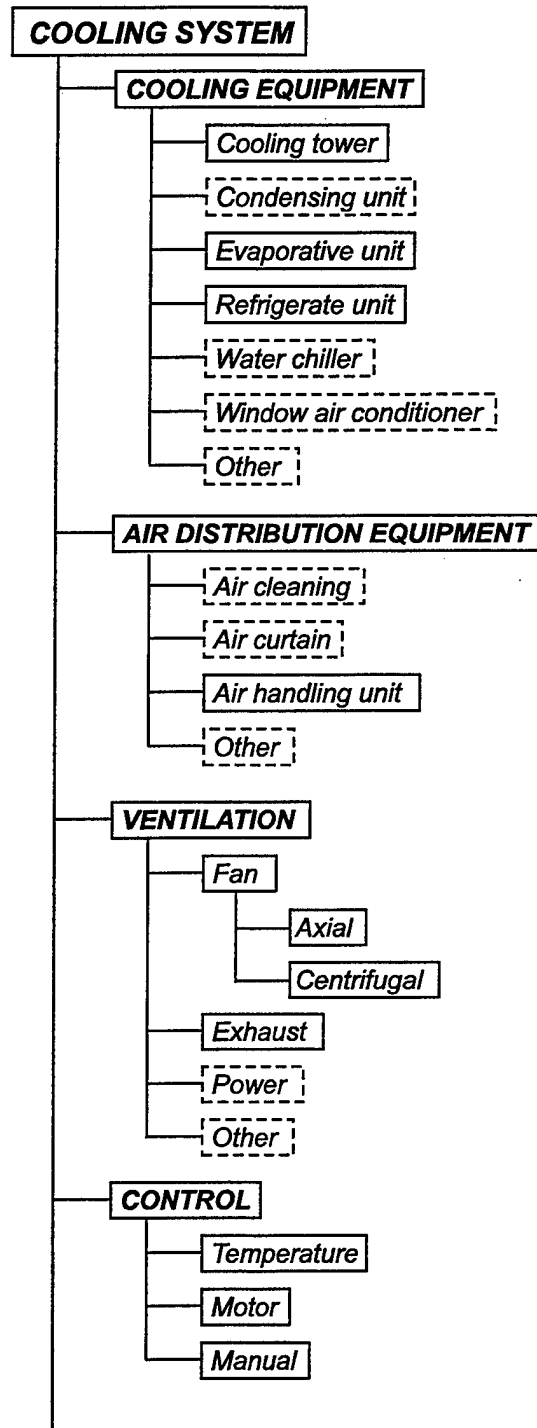


NOTE: All components and subcomponents in this system may have a finish applied to them.

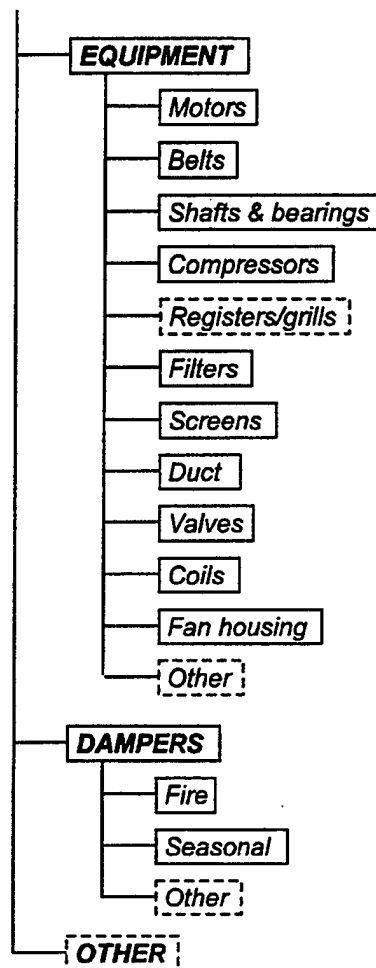
 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A32. Components and subcomponents of heating system.



Continued next page

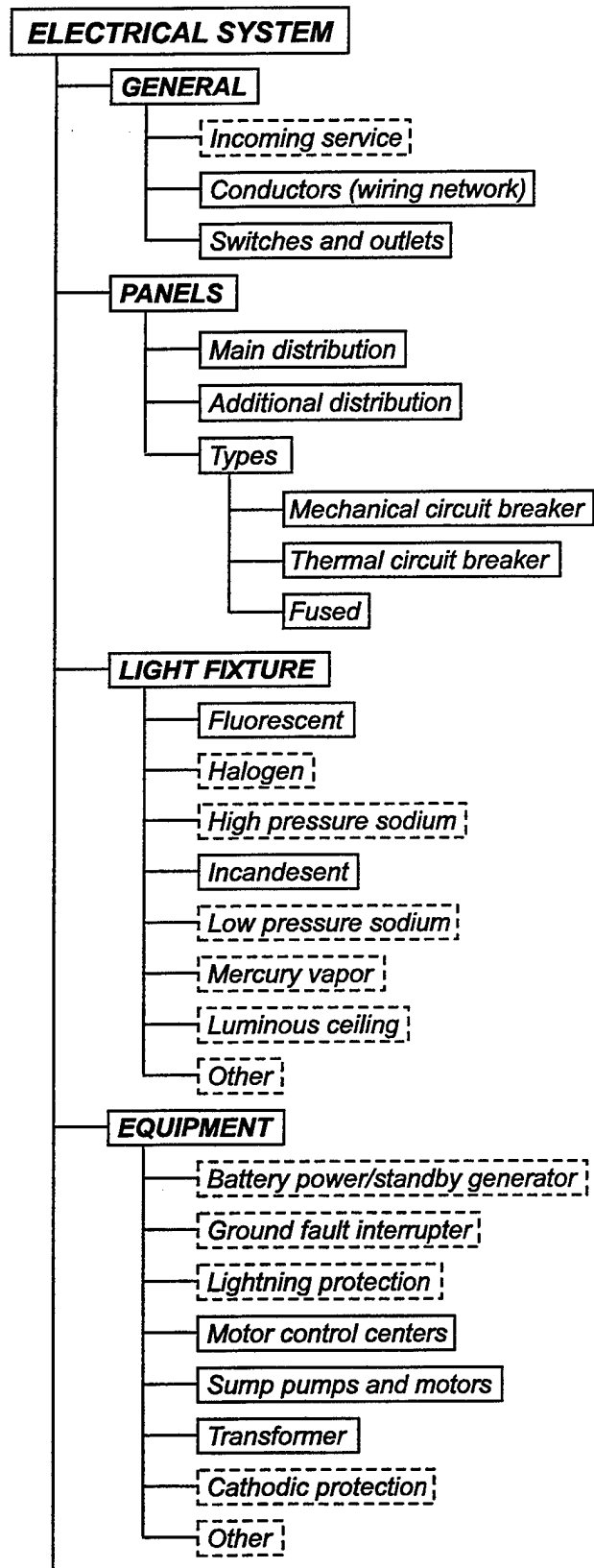


NOTE: All components and subcomponents in this system may have a finish applied to them.

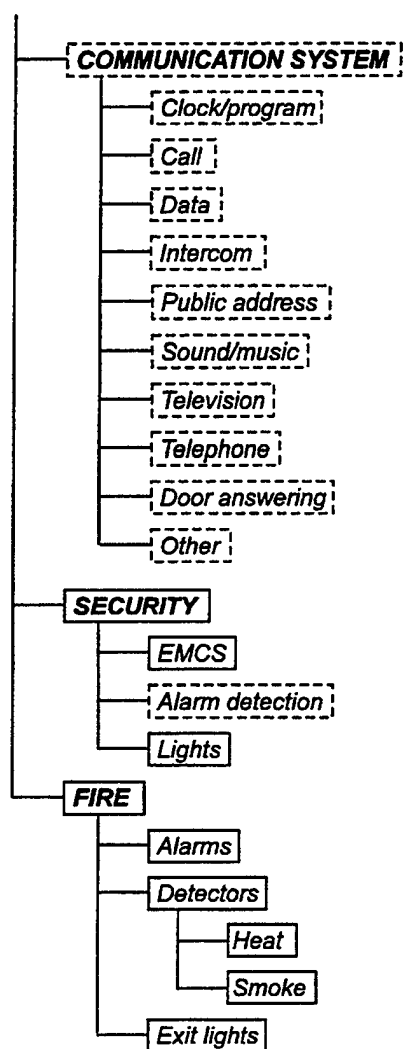
 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A33. Components and subcomponents of cooling system.



Continued next page



NOTE: All components and subcomponents in this system may have a finish applied to them.

 Component(s) and subcomponent(s) do not have specific checklists.

 Component(s) and subcomponent(s) may have specific checklists; see specific component and subcomponent for details.

Figure A34. Components and subcomponents of electrical system.

Appendix B: Key to Using Inspection and M&R Checklists for Historic Buildings

The objective of the inspection and M&R checklists is to help inspection and maintenance personnel identify and correct certain defects associated with historic building deactivation, periodic M&R, and reactivation.

The building systems checklists are not all-inclusive, so thereby they are only applicable to a limited variety of building components, subcomponents, and material types. To facilitate inspection and to group items by logical work type, the checklists are categorized into nine distinct systems:

1. Structural
2. Roofing
3. Exterior Closure
4. Interior Construction
5. Plumbing
6. Heating
7. Cooling
8. Electrical
9. Other.

These systems are further divided into components and subcomponents consisting of their common building elements. Each component and subcomponent (e.g., exterior wall surfaces) was individually examined for all its common elements or material types (e.g., brick masonry units). Checklists were then developed for each material type, listing all possible corrosive, deteriorating, defective, or unsightly conditions (e.g., cracks and holes). All these conditions are listed for each of the building subcomponents under the appropriate component heading.

When a decision to lay away a historic building has been made, that building enters the deactivation phase of the layaway cycle. Tasks to be performed during this phase are intended to place the specific component into a desired condition or layaway status. Periodic inspection and M&R occur at designated periods of time during the dormant phase of the layaway cycle. These activities preserve the

component at the desired condition or layaway state. The reactivation phase begins when a decision to activate a facility has been made. When a facility is to be reactivated, all its components and subcomponents must be brought into proper working order, and the systems restored to an appropriate condition level, and the historic characters of the building restored.

When a period-of-action notation (D, P, or R) appears in the columns for inspection, it signifies that if the specific distress is present, it should be noted for correction. Specific corrective actions are listed in the M&R portion of the checklists that correspond to the inspection findings.

A deactivation period is defined as a layaway cycle of either less than 1 year or greater than 1 year ($D < 1\text{yr}$ or $D > 1\text{yr}$). There is also a deactivation period of less than 30 days. This deactivation period is only to be used if transfer of the historic building to another agency is imminent (less than 30 days).

An "X" in any action-time combination column corresponds to applicable D, P, and R notations. When an "X" appears, an inspection is to be taken. Dual entries in some of the columns are not typographical errors, but signify different required actions for different action-time combinations.

To use a checklist, the period-of-action must be known. This originates from the decision matrices (as discussed in Volume I of Uzarski et al. [July 1991]). To users of the checklists, this decision will have been made beforehand by senior management personnel. The decision fixes the appropriate period-of-action to be used.

Example

Given: Facilities will be placed in a layaway status for a period exceeding 1 year.

A portion of the checklist for the exterior closure system, exterior wall surfaces for buildings is shown in Figure B1 (page B4).

In order to know what to inspect for, the user must go to a specific deactivation time frame. An "X" appearing indicates a potential action. Where an "X" is found, the user should move over to the "When to Inspt" column and note if a D, P, or R is present. These letters indicate that actions are required at **D**eactivation, **P**eriodically, and/or at **R**eactivation. Some actions may be needed at only one phase, but others may be needed at multiple phases.

In this example, and for a deactivation time period of less than 30 days, this chart shows that the brick masonry should not be inspected for cracks and holes first when the building is deactivated, and then periodically during the deactivation period. However, the brick masonry should be inspected for this time scenario when the building is reactivated.

For a deactivation period of less than 1 year, Figure B1 shows that the brick masonry should be inspected at deactivation, periodically during deactivation, and at reactivation.

For a deactivation period of greater than 1 year, Figure B1 shows that the brick masonry should be inspected at deactivation, periodically during deactivation, and at reactivation.

The checklist is used in a similar fashion for identifying required M&R actions, as shown in Figure B2.

If the inspection process finds cracks and holes, this checklist recommends how to repair them. In order to know how to repair, the user must go to a deactivation time frame. Any letters indicate a possible repair strategy. The repair strategies are explained in Chapter 4 of the text. The letters S, L, N, and C indicate whether repairs can be made with the Same material, a Like material, a Different material, or a Compatible material. Some actions may be needed at only one phase, whereas others may be needed at multiple phases.

For this example, and for a deactivation time period of less than 30 days, Figure B2 shows that the brick masonry should not be repaired for cracks and holes when the building is deactivated and periodically during the deactivation period. However, the brick masonry should be repaired with the same materials in the brick wall as it has currently or had when built. This will help retain the historic quality of the exterior closure system.

For a deactivation period of less than 1 year, Figure B2 shows that the brick masonry should be repaired with either the same material or a different material at deactivation, periodically during deactivation, and at reactivation. The material used depends on the Memorandum of Agreement (MOA) and whether the material detracts from the historical nature of the building.

For a deactivation period of greater than 1 year, the brick masonry should be repaired with either the same material or a different material at deactivation, periodically during deactivation, and at reactivation. The material used depends

on the MOA and whether the material detracts from the historical nature of the building.

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material

C = Compatible method

BRICK MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X

The following can be interpreted from the checklist:

System: EXTERIOR CLOSURE

Component: EXTERIOR WALL

Subcomponent: SURFACES

Figure B1. Sample exterior closure inspection checklist.

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material

C = Compatible method

BRICK MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
M&R activities as required:				
Repair cracks & holes	D/P R	S	N/S S	N/S S

Figure B2. Sample exterior closure M&R checklist.

Appendix C: Inspection and M&R Checklists for Structure

General Notes About Structure

If the structural features of the building are exposed to view, they can help in defining the historic nature of the building. The structural system of the building *must* be maintained, both for the life safety of those who inspect the building in its laid away state and to maintain the historic nature of the building.

Failures occurring during the normal life expectancy of buildings and structures should be carefully investigated, and the fundamental defects corrected before superficial repair.

If the cause of the failure is not immediately discernible, or if the corrective measures are not straightforward or standard, advice should be obtained from qualified architects or structural engineers. Most of the defects listed for the structural components could result from a number of mechanisms. The cause and extent of deterioration may simply be unknown.

The architect or engineer should determine the cause of the deterioration and the strength of the existing structure, then provide recommendations about how to proceed. These recommendations may include:

1. Permitting deterioration to continue
2. Taking measures to preserve the structure in its present condition without any attempt to strengthen it
3. Strengthening the construction
4. Reconstructing or abandoning the construction if deterioration is exceptionally severe.

The decision should be rendered on the basis of considerations of safety, economics, and appearance.

Moisture Intrusion

If moisture or water intrusion are present, determine the source and remediate.

Cracks

Before any attempt is made to repair a crack, an investigation should be undertaken to determine its cause. The following precautions should be observed:

1. Do not attempt to repair cracks as soon as they appear. Observe the cracks periodically over time to determine whether the crack is active or passive. Determine the cause of the crack and correct it.
2. Do not attempt to repair a fine crack by chiseling out a deep groove and repointing. Repair fine cracks by filling or bridging over with a cement-based wash or paint.
3. Do not caulk cracks above grade with light plastic or dark bituminous caulking compounds that will contrast with the wall finish. If such materials must be used, seal the caulking by coating with a shellac or aluminum paint and then paint to match the surrounding area.

Holes

Take immediate corrective measures if holes are of a size or depth that may cause substrate deterioration or permit water penetration.

Concrete Masonry Walls

For bowing, bulging, and out-of-plumb concrete masonry walls and retaining walls, note that general deviations from the vertical and horizontal in excess of 1 foot per 240 foot of the unsupported length, or 1/2 in. per 10 ft, are likely to be noticed and should be investigated by a qualified architect or structural engineer.

General Notes About Repairs

Repairs to the structure system, components, and subcomponents should be done in a sensitive way. Some of the structure system is hidden from view by walls or similar items. These walls will have to be removed or portions of them removed before repairs to the structure system can be made. Removing the walls to make repairs and repairing walls should follow all applicable guidelines in this report.

General Notes About Painting

When corrosion is removed from a surface, that surface must receive touch-up paint.

Existing paint coatings may contain lead, which is a hazardous material. Special precautions must be taken when working with or around such coatings. See Volume I of Uzarski et al. [July 1991] for more information.

If pitting corrosion is present, remove corrosion, spot prime, and topcoat the entire surface. If pitting corrosion continues, determine cause of corrosion and fix the condition before performing any further M&R.

Interior Metal

Perform surface preparation of general corrosion covering 3 percent or more, and pitted corrosion covering 0.1 percent or more of the surface.

Interior Concrete

Perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

Interior Wood

Where noted perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

Checklists

The structural system consists of the architectural and structural elements contained within the building envelope. Its components are foundations, load-bearing walls (covered in the exterior closure system), columns, roof structure, and joists, beams, and girders. Only the subcomponents listed below have checklists.

Component and Subcomponent List for Structural System

Foundations

Load-Bearing Walls

Columns

Roof Structure

Roof Rafters & Purlins

Trusses

Joists, Beams, and Girders

STRUCTURAL SYSTEM

ROOF STRUCTURE - TRUSSES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
TRUSSES	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Excessive deflection * (greater than L/180)	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Twisted or bowed members *	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Decay or rot	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Checks and splits *	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Separation or slippage at joints	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Loose connections, bolts, rivets	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Corrosion	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Rupture, shearing or crushing of steel plates, members, bolts and rivets *	D/P/R R	X	X	X
=====	=====	=====	=====	=====

* All of the inspection items listed can manifest themselves into a serious structural problem, however the marked items are more likely to do so. If the cause of the defect or local failure is not immediately discernible; or if the corrective measures are not straightforward or standard, consultation and advice should be obtained from a qualified architect or structural engineer.

STRUCTURAL SYSTEM

ROOF STRUCTURE - TRUSSES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Determine and relieve cause of overload	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Replace rotted member, eliminate cause, ventilate area	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Close split with stitch bolts or clamps *	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Tighten or replace bolts	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Remove minor corrosion, eliminate source of moisture	D/P/R	C	C	C
=====	=====	=====	=====	=====

* All of the inspection items listed can manifest themselves into a serious structural problem, however the marked items are more likely to do so. If the cause of the defect or local failure is not immediately discernible; or if the corrective measures are not straightforward or standard, consultation and advice should be obtained from a qualified architect or structural engineer.

STRUCTURAL SYSTEM

ROOF STRUCTURE - ROOF RAFTERS & PURLINS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

ROOF RAFTERS AND PURLINS (pitched and flat)	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Sagging of roof (flat) *	D/P/R R	X	X	X
Ridge sagging (pitched) *	D/P/R R	X	X	X
Loose bolts or nails	D/P/R R	X	X	X
Cracked, split or broken members *	D/P/R R	X	X	X
Insect damage	D/P/R R	X	X	X
M&R activities as required:				
Tighten bolts or secure nails	D/P R	C	C	C
Replace member if insect damage is extensive, elimin- ate cause	D/P R	C	C	C
Strengthen split or broken members *	D/P R	C	C	C

* All of the inspection items listed can manifest themselves into a serious structural problem, however the marked items are more likely to do so. If the cause of the defect or local failure is not immediately discernible; or if the corrective measures are not straightforward or standard, consultation and advice should be obtained from a qualified architect or structural engineer.

STRUCTURAL SYSTEM

JOISTS, BEAMS, & GIRDERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

JOISTS, BEAMS & GIRDERS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Excessive deflection (all) (greater than L/240) *	D/P/R R	X	X	X
Loose bridging (wood)	D/P/R R	X	X	X
Insecure nailing (wood)	D/P/R R	X	X	X
Insect damage or rot (wood)	D/P/R R	X	X	X
Insufficient bearing * (all)	D/P/R R	X	X	X
Checks and splits *	D/P/R R	X	X	X
Poor quality welds (steel)	D/P/R R	X	X	X
Corrosion (steel) *	D/P/R R	X	X	X
Localized buckling at or near ends of supports *	D/P/R R	X	X	X
Distorted seat angle * (steel)	D/P/R R	X	X	X
Cracks near supports * (concrete)	D/P/R R	X	X	X

* All of the inspection items listed can manifest themselves into a serious structural problem, however the marked items are more likely to do so. If the cause of the defect or local failure is not immediately discernible; or if the corrective measures are not straightforward or standard, consultation and advice should be obtained from a qualified architect or structural engineer.

STRUCTURAL SYSTEM

JOISTS, BEAMS, & GIRDERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Secure bridging and nails	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Replace rotted member, elim-	D/P		N/S	N/S
inate cause, ventilate area	R	S	S	S
-----	-----	-----	-----	-----
Remove minor corrosion,	D/P		C	C
eliminate source of moisture	R	C	C	C
=====	=====	=====	=====	=====

STRUCTURAL SYSTEM

COLUMNS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

COLUMNS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Out of plumb, buckled or bowed *	D/P/R R	X	X	X
Evidence of water problems at base plate	D/P/R R	X	X	X
Rot or deterioration	D/P/R R	X	X	X
Checks or splits at connections *	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Cracking of concrete cover, exposing reinforcing *	D/P/R R	X	X	X
Rust staining on concrete *	D/P/R R	X	X	X
Cracking at column/slab interface *	D/P/R R	X	X	X

* All of the inspection items listed can manifest themselves into a serious structural problem, however the marked items are more likely to do so. If the cause of the defect or local failure is not immediately discernible; or if the corrective measures are not straightforward or standard, consultation and advice should be obtained from a qualified architect or structural engineer.

STRUCTURAL SYSTEM

COLUMNS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Identify and remedy water	D/P		C	C
problem	R	C	C	C
-----	-----	-----	-----	-----
Replace rotted member, elim-	D/P		N/S	N/S
inate cause, ventilate area	R	S	S	S
-----	-----	-----	-----	-----
Remove minor corrosion,	D/P/R		C	C
eliminate source of moisture		C	C	C
=====	=====	=====	=====	=====

* All of the inspection items listed can manifest themselves into a serious structural problem, however the marked items are more likely to do so. If the cause of the defect or local failure is not immediately discernible; or if the corrective measures are not straightforward or standard, consultation and advice should be obtained from a qualified architect or structural engineer.

Appendix D: Inspection and M&R Checklists for Roofs

Maintaining the roof is important for preserving a deactivated historic building. The major function of a roof is to protect the building from the deteriorating effects of moisture intrusion. Roof leaks can damage the building structural system, exterior closure, interior construction, and the historic character of the building. To protect the roof itself, it is important to minimize roof leaks. The accumulation of moisture in the roofing system increases degradation of the roofing system, reduces the effectiveness of insulation, adds weight to the structural system, and causes other problems such as rotting of wood decks, corrosion of metal fasteners and decks, and loss of membrane or substrate adherence.

Checklist Development

The "built-up roofing" and "shingled roofing" checklists prepared for the roofing component were based on the inspection guidelines for ROOFER, an engineered management system for built-up roofs (BURs). The BUR distress checklist was a modification of the distress manual CERL TR M-87/13 Vol II, *Membrane and Flashing Condition Indexes for Built-Up Roofs Volume II: Inspection and Distress Manual*.

The checklists contain two different severity levels. A medium-severity distress indicates noticeable deterioration, and repair should be scheduled during the next maintenance cycle. A high-severity distress indicates excessive deterioration with high risk to integrity of the roofing system, and immediate repair or replacement is required.

Inspection and M&R Procedures

The visual inspection is an excellent method of finding roofing problems which can be repaired before major damage occurs. This is true for both actively used and deactivated buildings. The inspection procedure described in the CERL TR M-

90/04, *ROOFER: An Engineered Management System (EMS) for Bituminous Built-Up Roofs*, should be used in conjunction with the provided checklists. CERL TR M-87/13 Vol II, *Membrane and Flashing Condition Indexes for Built-Up Roofs Volume II: Inspection and Distress Manual*, includes more detailed descriptions and color photographs for identifying BUR distresses. Similarly, the CERL technical report FM-93/11, *ROOFER Membrane and Flashing Condition Indexes for Single-Ply Membrane Roofs-Inspection and Distress Manual*, contains descriptions for identifying single-ply distresses. A single-ply checklist can be extracted from the report.

It is not possible to find all potential sources of leaks during the visual inspection. This is especially true when the roof membrane is hidden by a layer of ballast. For an occupied building, roof leaks would be reported before substantial damage was done to the interior of the building. For deactivated buildings, interior inspections must be performed to find leaks and stop them in order to limit damage. Leaks should be documented, their sources identified, and repairs performed. These areas should be periodically rechecked for continuing leakage. Documentation of the previous damage is critical for determining if new leaks have occurred.

The checklists provide general repair procedures for each of the distresses. This information can be supplemented with the NRCA/ARMA *Manual of Roof Maintenance and Roof Repair*, and CERL TR M-89/04, *Handbook for Repairing Nonconventional Roofing Systems*.

General Notes About Roofing

Visual inspections for built-up and single-ply roofs should be performed in accordance with CERL TR M-87/13, Vol II and FM 93/11, respectively. As part of all visual inspections, debris should be removed from the rooftop and all drains and scuppers should be cleared.

The deactivation inspection should include a nondestructive roof moisture survey in accordance with CERL TR M-90/04. One method of doing a nondestructive roof moisture survey is to use the aerial infrared technique. Assistance to do an aerial infrared scan can be provided by CERL.

Temporary repairs of all recorded high-severity distresses should be made immediately to alleviate immediate water entry problems until permanent repairs can be made. Except for the periodic inspection minimal option, in which only temporary repairs are performed, permanent repair of all recorded distresses

should be accomplished, as should replacement of all wet insulation in membrane roofing systems.

The periodic visual inspection of the roof should be accomplished on an annual basis, preferably in the spring.

Interior inspections for roof leakage activity should be done in conjunction with the building interior inspections.

Distresses of Roofing System Subcomponents

Built-up Roofing

- Base Flashing (BF)
- Metal Cap Flashing (MC)
- Embedded Edge Metal (EM)
- Flashed Penetrations (FP)
- Pitch Pans (PP)
- Interior Drains and Roof Level Scuppers (DR)
- Blisters (BL)
- Ridges (RG)
- Splits (SP)
- Holes (HL)
- Surface Deterioration (SC)
- Slippage (SL)
- Patching (PA)
- Debris and Vegetation (DV)
- Improper Equipment Supports (EQ)
- Ponding (PD)
- Wet insulation

Shingled Roofing

- Step Flashing
- Metal Cap Flashing
- Flashed Penetrations
- Valley Flashing
- Caulking
- Clawing
- Improper Nailing/Nail Rejection

Breakage/Damage

Blistering

Loose Tabs

Ice Dams

Debris and Vegetation

Improper Equipment Supports

ROOFING SYSTEM

BUILT-UP ROOFING

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

BASE FLASHING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
BFH1 - Holes, splits, or tears in flashing caused by deterioration or physical damage.	D/P/R R	X	X	X
BFH2 - Exposed gaps at the top of the base flashing which are not covered by counterflashing or open side laps in the flashing which allow water to channel behind them.	D/P/R R	X	X	X
BFH3 - Grease, solvent, or oil drippings on the base flashing with deterioration of the felts.	D/P/R R	X	X	X
BFM1 - Slippage, wrinkling, blistering, or pulling of base flashing material.	D/P/R R	X	X	X
BFM2 - Loss of surfacing with some deterioration of felts but no holes, splits, or tears.	D/P/R R	X	X	X
BFM3 - Grease, solvent, oil drippings on the base flashing but no deterioration of felts.	D/P/R R	X	X	X
BFM4 - Flashing has temporary repairs.	D/P/R R	X	X	X

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
BFH1 - Repair damaged base flashing by overlaying each localized defect with new base flashing.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
BFH2 - Install extension of counterflashing over exposed top termination of base flashing. Three course open side laps in base flashing.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
BFH3 - Remove contaminate and affected base flashing material. Prime surface and install new base flashing.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
BFM1 - Cut and re-secure unbonded base flashing, mechanically fasten slipped flashing and apply cold patch over all repairs.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
BFM2 - Prime exposed and deteriorated base flashing and coat with heavy bodied asphalt coating.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
BFM3 - Remove contaminants from undamaged base flashing, prime and coat areas with heavy bodied asphalt coating.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
BFM4 - Remove temporary repair material from base flashing, reinforce patch as necessary and coat with heavy asphalt coating	D/P R	S	N/S S	N/S S
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
METAL CAP FLASHING	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
MCH1 - Metal coping cap or counterflashing is missing or displaced from its original position.	D/P/R R	X	X	X
MCH2 - Corrosion holes have occurred through the metal on a horizontal surface.	D/P/R R	X	X	X
MCH3 - Metal coping cap has missing joint covers where joint covers were originally installed.	D/P/R R	X	X	X
MCM1 - Corrosion holes have occurred through the metal on a vertical surface.	D/P/R	X	X	X
MCM2 - Metal coping cap has loose fasteners, failure of soldered joints, open joints, or loss of attachment	D/P/R R	X	X	X
MCM3 - Sealant at reglet or top of counterflashing is missing or no longer functioning, allowing water to channel behind it.	D/P/R R	X	X	X
MCM4 - Counterflashing is loose at the top, allowing water to channel behind it.	D/P/R R	X	X	X
MCM5 - Counterflashing does not extend over the top of the base flashing.	D/P/R R	X	X	X
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
MCH1 - Reinstall displaced metal cap flashing or replace with new material.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
MCH2 - Replace metal cap flashing with new corrosion resistant material.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
MCH3 - Replace missing joint covers on metal coping cap.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
MCM1 - Clean and patch holes in metal cap flashing and coat entire surface with corrosion resistant paint.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM2 - Reseal failed joints in metal coping cap and reattach.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM3 - Remove faulty sealant at reglet or top of counterflashing and reseal.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM4 - Reinstall displaced counterflashing into its original position and fasten.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM5 - Add extension or replace counterflashing to cover top of base flashing.	D/P R	S	N/S S	N/S S
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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EMBEDDED EDGE METAL	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
EMH1 - Stripping felts are missing or loose.	D/P/R R	X	X	X
EMH2 - Splits in the stripping felts above the metal joints.	D/P/R R	X	X	X
EMH3 - Holes have occurred through the metal.	D/P/R R	X	X	X
EMH4 - Loose or lifted metal flange with deterioration of the stripping felts.	D/P/R R	X	X	X
EMH5 - Holes or joint movement are present in the interior gutter.	D/P/R R	X	X	X
EMM2 - Nails under the stripping felt are backing out.	D/P/R R	X	X	X
EMM3 - Corrosion of the metal.	D/P/R R	X	X	X
EMM4 - Loose or lifted metal flange without deterioration of the stripping felts.	D/P/R R	X	X	X

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
EMH1 - Prime and three course edge metal flange in affected area.	D/P R	C	C	C C
-----	-----	-----	-----	-----
EMH2 - Place stripping felts and surfacing mater- ial over split areas.	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
EMH3 - Remove sections (10') of edge metal having holes and replace.	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
EMH4 - Refasten loose edge metal flange into solid support. Replace stripping felts and surfacing material.	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
EMH5 - Clean interior of gutter to smooth bare metal. Line gutter with waterproof membrane.	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
EMM2 - Remove loose nails in embedded edge metal and renail into solid support. Three course over new fasteners.	D/P R	C	C	C C
-----	-----	-----	-----	-----
EMM3 - Remove surface cor- rosion, prime and coat edge metal with corrosion resistant paint.	D/P R	C	C	C C
-----	-----	-----	-----	-----
EMM4 - Re-nail loose edge metal flange into solid support. Three course over new fasteners.	D/P R	C	C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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FLASHED PENETRATIONS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
FPH1 - Flashing sleeve or metal curb has been installed with no stripping felts.	D/P/R R	X	X	X
FPH2 - Flashing sleeve or metal curb is cracked, broken, or corroded through.	D/P/R R	X	X	X
FPH3 - No flashing sleeve is present.	D/P/R R	X	X	X
FPH4 - Penetration is not sealed at the membrane level.	D/P/R R	X	X	X
FPM1 - Edge of stripping felts is exposed but there is no apparent felt deterioration.	D/P/R R	X	X	X
FPM2 - Top of flashing sleeve is not sealed or has not been rolled into existing plumbing vent stack.	D/P/R R	X	X	X
FPM3 - The sleeve or umbrella is open or no umbrella is present (where required).	D/P/R R	X	X	X
FPM4 - Metal is corroded.	D/P/R R	X	X	X

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
FPH1 - Clean, prime and seal unflashed flanges on flashed penetrations.	D/P R	C	C	C C
FPH2 - Remove damaged flashing sleeves or curbs and replace.	D/P R	S	S	N/S S
FPH3 - Install missing flashing sleeves on flashed penetrations.	D/P R	S	S	N/S S
FPH4 - Prime surface and three course unsealed flashed penetrations.	D/P R	C	C	C C
FPM1 - Restore surfacing over exposed stripping felts around flashed penetrations.	D/P R	S	S	N/S S
FPM2 - Seal top of flashing sleeves around flashed penetrations.	D/P R	S	S	N/S S
FPM3 - Install an umbrella or weather hood on flashed penetrations.	D/P R	S	S	N/S S
FPM4 - Remove surface corrosion, prime and coat with corrosion resistant paint on flashed penetrations.	D/P R	C	C C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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PITCH PANS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
PPH1 - Metal Corrosion	D/P/R R	X	X	X
PPH2 - Sealing material is below metal rim.	D/P/R R	X	X	X
PPH3 - Stripping felts are exposed or deteriorated.	D/P/R R	X	X	X
PPH4 - Sealing material has cracked or separated from pan or penetration.	D/P/R R	X	X	X
M&R activities as required:				
PPH1 - Remove all corrosion prime and coat corroded pitch pans with corrosion resistant paint or replace damaged pitch pan.	D/P R	C	C	C
PPH2 - Fill pitch pans with sealant and crown to assure water runoff.	D/P R	C	C	C
PPH3 - Prime and three course pitch pans having deteriorated stripping felts.	D/P/ R	C	C	C
PPH4 - Fill distressed pitch pans with sealant and crown to assure water runoff.	D/P R	C	C	C

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
DRAINS AND ROOF LEVEL SCUPPERS	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
DRH1 - Stripping felts have holes or are deteriorated.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
DRH2 - Clamping ring is loose or missing from drain body or bolts are missing.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
DRH3 - Drain is clogged.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
DRH4 - Scupper metal is broken or holes have occurred through the metal.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
DRM1 - Stripping felts are exposed but there is no apparent deterioration of felts.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
DRM2 - Strainer is broken or missing.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
DRM3 - Scupper shows loss of paint or protective coating or start of metal corrosion.	D/P/R R	X	X	X
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
DRH1 - Remove deteriorated stripping felts around drains and scuppers, clean surface and prime. Replace stripping felt and restore surfacing material.	D/P R S S			N/S S
DRH2 - Reinstall loose or missing clamping ring on roof drains.	D/P R S S			N/S S
DRH3 - Remove foreign material clogging roof drains.	D/P R S C C			C C
DRH4 - Install new scuppers in place of broken or cracked scuppers.	D/P R S S			N/S S
DRM1 - Prime and coat surface of roof drains having exposed stripping felts with heavy bodied asphalt coating.	D/P R C C			C C
DRM2 - Install new drain strainers where broken or missing.	D/P R S N/S S			N/S S
DRM3 - Remove all loose paint and corrosion around distressed scupper, prime and coat with corrosion resistant paint.	D/P R C C C			C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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BLISTERS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
BLH1 - The blisters are broken.	D/P/R R	X	X	X
BLM1 - The felts are exposed or show deterioration.	D/P/R R	X	X	X
M&R activities as required:				
BLH1 - Remove broken blister, repair surface and restore surfacing material.	D/P R	S	S	N/S S
BLM1 - Restore surfacing material on blisters which have exposed felts.	D/P R	S	S	N/S S

ROOFING SYSTEM

BUILT-UP ROOFING

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RIDGING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
RGH1 - Open breaks have developed in the ridge.	D/P/R R	X	X	X
RGH2 - Felt deterioration has progressed through the top ply, exposing underlying plies.	D/P/R R	X	X	X
RGM1 - The ridges are raised and clearly visible. The surfacing on the ridges is gone and the top felt is exposed.	D/P/R R	X	X	X
M&R activities as required:				
RGH1 - Remove broken ridges repair membrane and restore surfacing material.	D/P R	S	N/S S	N/S S
RGH2 - Remove broken ridges repair membrane and restore surfacing material.	D/P R	S	S	N/S S
RGM1 - Restore surfacing material on ridges which have exposed felts.	D/P R	S	N/S S	N/S S

ROOFING SYSTEM

BUILT-UP ROOFING

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SPLITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
SPH1 - An unrepaired split or a repaired split which has started to re-open.	D/P R	X	X	X
M&R activities as required:				
SPH1 - Repair splits and restore surfacing material.	D/P R	S	N/S S	N/S S
HOLES				
Inspect for:				
HLH1 - All holes.	D/P/R R	X	X	X
M&R activities as required:				
HLH1 - Repair holes and restore surfacing.	D/P/R R	S	N/S S	N/S S

ROOFING SYSTEM

BUILT-UP ROOFING

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SURFACE DETERIORATION	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
SRH1 - On aggregate surfaced roofs, the aggregate cover has been displaced and the top coat of bitumen is exposed.	D/P/R R	X	X	X
SRH2 - On mineral surfaced-cap sheet roofs, the cap sheet felt is deteriorated.	D/P/R R	X	X	X
SRH3 - On smooth surfaced roofs, alligator cracks extend down through one or more plies.	D/P/R R	X	X	X
SRH4 - Shrinking of the walkway has torn the membrane below it.	D/P/R R	X	X	X
SRM1 - On aggregate surfaced roofs, the aggregate is displaced and the top coat of bitumen is exposed.	D/P/R	X	X	X
SRM2 - On mineral surfaced-cap sheet roofs, the mineral granules have come off the cap sheet, exposing the underlying felt.	D/P/R R	X	X	X
SRM3 - On smooth surfaced roofs, no surface coating exists or there is a loss of surface coating.	D/P/R R	X	X	X

ROOFING SYSTEM

BUILT-UP ROOFING

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SURFACE DETERIORATION	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
SRM4 - On smooth surfaced roofs, alligator cracks extend down through the bitumen to the top of the felt.	D/P/R R	X	X	X
M&R activities as required:				
SRH1 - Repair deteriorated felts and restore surfacing aggregate.	D/P R	S	N/S S	N/S S
SRH2 - Repair deteriorated membrane surfaces and restore surfacing material.	D/P R	S	N/S S	N/S S
SRH3 - Repair affected area and coat surface with hot bitumen only.	D/P R	S	N/S S	N/S S
SRH4 - Remove walkway, repair damaged membrane and replace walkway.	D/P R	S	N/S S	N/S S
SRM1 - Reinstall aggregate on exposed membrane surfaces.	D/P R	S	S	N/S S
SRM2 - Restore granules on exposed surfaces.	D/P R	S	S	N/S S
SRM3 - Coat exposed surfaces with asphalt emulsion.	D/P R	S	S	N/S S

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
SRM4 - Remove excess asphalt in affected areas and coat with asphalt membrane.	D/P R	S	S	N/S S
=====	=====	=====	=====	=====
=====	=====	=====	=====	=====
SLIPPAGE	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
SLH1 - More than 2 inch of slippage has occurred, There is evidence of humping and wrinkling.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
SLH1 - Remove membrane irregularities in area of slippage, fasten and repair membrane and restore surfacing material.	D/P R	S	S	N/S S
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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PATCHING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
PAH1 - Ruptures or other membrane distresses are present within the patched area.	D/P/R R	X	X	X
PAM1 - The materials and workmanship of the patch are not equal to or better than the existing membrane.	D/P/R R	X	X	X
M&R activities as required:				
PAH1 - Replace distressed patches with material of same or better quality than existing membrane. Restore surfacing material.	D/P R	S	S	N/S S
PAM1 - Replace patches having inferior repair material with same or better quality than existing membrane. Restore surfacing material.	D/P R	S	S	N/P S

ROOFING SYSTEM

BUILT-UP ROOFING

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DEBRIS AND VEGETATION	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
DVH1 - Grease, solvent, or oil drippings on the roof, causing degradation to the membrane.	D/P/R R	X	X	X
DVH2 - Vegetation roots that have penetrated the felts.	D/P/R R	X	X	X
DVM1 - The collection of foreign objects which are not removed from the roof during the inspection.	D/P/R R	X	X	X
DVM2 - Grease, solvent, or oil drippings on the roof which show no degradation of the roof membrane.	D/P/R R	X	X	X
DVM3 - Evidence of vegetation, but not penetrating the felts.	D/P/R R	X	X	X
M&R activities as required:				
DVH1 - Remove contaminate and effected parts of the roof system, repair membrane and restore surfacing material.	D/P R	S	S	N/S S
DVH2 - Remove vegetation and effected areas of the membrane, repair membrane and restore surfacing material.	D/P R	S	S	N/S S

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
DVM1 - Remove foreign objects from roof.	D/P R	C	C	C C
-----	-----	-----	-----	-----
DVM2 - Remove contaminants from undamaged roof mem- brane and restore surfacing material.	D/P R	C	C	C C
-----	-----	-----	-----	-----
DVM3 - Clean surface of all dirt and vegetation.	D/P R	C	C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	When	D<30d	D<1yr	D>1yr
IMPROPER EQUIPMENT SUPPORTS	to Inspt			
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
EQH1 - The support has caused damage to the roof membrane.	D/P/R R	X	X	X
EQH2 - The equipment is bolted through the membrane and the bolts appear not to be water tight.	D/P/R R	X	X	X
EQM1 - Movement of the support has caused displacement of the roof surfacing but has not damaged the membrane.	D/P/R R	X	X	X
EQM2 - The equipment is bolted through the membrane and the bolts appear to be sealed.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
EQH1 - Repair damaged membrane under equipment support, install flashing device appropriate to the problem.	D/P R	S	S	N/S S
EQH2 - Install pitch pans at support and flash into membrane.	D/P R	S	S	N/S
EQM1 - Replace improper equipment supports with device allowing for movement of equipment.	D/P R	C	C	C C
-----	-----	-----	-----	-----

ROOFING SYSTEM

BUILT-UP ROOFING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
EQM2 - Install pitch pans at unflashed supports and flash into membrane.	D/P R	S	S	N/S S
=====	=====	=====	=====	=====

=====	=====	=====	=====	=====
WET INSULATION	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Remove wet roof insulation, inspect the deck, and repair. If necessary, replace the roofing system, including adjacent flashings.	D/P R	S	S	N/S S
-----	-----	-----	-----	-----

ROOFING SYSTEM

SHINGLES

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STEP FLASHING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
SFH1 - Holes in metal flashing caused by deterioration or physical damage.	D/P/R R	X	X	X
SFH2 - Exposed gaps at top of step flashing.	D/P/R R	X	X	X
SFH3 - Corrosion holes have occurred through the metal on roof level surface.	D/P/R R	X	X	X
SFM1 - Corrosion holes have occurred through the metal on a vertical surface.	D/P/R R	X	X	X
SFM2 - Step flashing has temporary repairs.	D/P/R R	X	X	X
M&R activities as required:				
SFH1 - Replace damaged step flashing.	D/P R	S	N/S S	N/S S
SFH2 - Resecure loose step flashing and caulk with quality elastomeric sealant.	D/P R	S	N/S S	N/S S
SFM1 - Perform appropriate repair for either vertical or roof level surface.	D/P R	S	N/S S	N/S S

ROOFING SYSTEM

SHINGLES

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METAL CAP FLASHING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
MCH1 - Counterflashing is displaced or missing.	D/P/R R	X	X	X
MCH2 - Through metal corrosion on a horizontal surface.	D/P/R R	X	X	X
MCH3 - Metal coping cap has missing joint covers where covers were originally installed.	D/P/R R	X	X	X
MCM1 - Through metal corrosion on vertical surfaces.	D/P/R R	X	X	X
MCM2 - Metal coping cap with loose fasteners, failure of sealed joints, open joints, loss of attachment.	D/P/R R	X	X	X
MCM3 - Sealant at reglet or top of counterflashing is missing or no longer functional, allowing water to channel behind it.	D/P/R R	X	X	X
MCM4 - Counterflashing is loose at top allowing water to channel behind it.	D/P/R R	X	X	X
MCM5 - Counterflashing does not extend over flashing	D/P/R R	X	X	X

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
MCH1 - Repair displaced flashing or install new flashing.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
MCH2 - Replace missing joint covers on metal coping cap and reattach.	D/P/R R	S	N/S S	N/S S
-----	-----	-----	-----	-----
MCM1 - Clean and patch holes in metal cap flashing and coat entire surface with corrosion resistant paint.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM2 - Reseal failed joints in metal coping cap and reattach.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM3 - Remove faulty sealant at reglet or top of counterflashing and reseal.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM4 - Reinstall displaced counterflashing into its original position and fasten.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
MCM5 - Add extension or replace counterflashing to cover top of step flashing.	D/P R	S	N/S S	N/S S
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

FLASHED PENETRATIONS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
FPH1 - Holes, cuts, or tears in flashing sleeve or metal curb.	D/P/R R	X	X	X
FPH2 - No flashing sleeve present (where required).	D/P/R R	X	X	X
FPM3 - Top of flashing sleeve is not sealed or rolled into the existing plumbing vent stack. Clamping band is loose or missing (where required).	D/P/R R	X	X	X
FPM4 - The sleeve or umbrella is open or no umbrella is present (where required).	D/P/R R	X	X	X
FPM5 - Corrosion of metal.	D/P/R R	X	X	X
M&R activities as required:				
FPH1 - Remove damaged flashing sleeves or curbs and replace.	D/P R	S	N/S S	N/S S
FPH2 - Install missing flashing sleeves on flashed penetrations.	D/P R	S	S	N/S S

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
FPM3 - Seal top of flashing sleeves around flashed penetrations.	D/P R	C C	C C	C C
-----	-----	-----	-----	-----
FPM4 - Install an umbrella or weather hood on flashed penetrations.	D/P R	S S	N/S S	N/S S
-----	-----	-----	-----	-----
FPM5 - Remove surface corrosion, prime and coat metal flashing with corrosion resistant paint.	D/P R	C C	C C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
VALLEY FLASHING	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
VFH1 - For metal valley flashings, corrosion holes through the metal.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
VFH2 - For mineral surfaced roll roofing valleys, end laps are separated or not sealed down.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
VFH3 - Shingles have separated from valleys.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
VFH1 - Isolated holes can be repaired with caulk or sheet metal and caulk. Extensive deterioration may require replacement of valley flashing.	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
VFH2 - Apply liberal amounts of plastic cement between plies.	D/P R	C	C	C C
-----	-----	-----	-----	-----
VFH3 - Apply liberal amounts of plastic cement between shingles and flashing.	D/P R	C	C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
CAH1 - Deteriorated, split, or missing caulk on flashing or counterflashing.	D/P/R R	X	X	X
M&R activities as required:				
CAH1 - Remove old caulk, clean, and apply elastomeric sealant.	D/P R	C	C	C

CLAWING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
CLM1 - Shingle is clawed and center of tab is raised more than 1/4 inch.	D/P/R R	X	X	X
M&R activities as required:				
CLM1 - No repair. Extensive clawing may require roof replacement in the near future.	R	S	S	S

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
IMPROPER NAILING / NAIL REJECTION	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
INM1 - Nails pushing up on shingle above head.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
INM1 - Remove accessible nails (under tab), seal hole with plastic cement, and renail in new location.	D/P R	C	C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

BREAKAGE/DAMAGE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
BRH1 - Breakage or deterioration of shingles extending beyond the tabs.	D/P/R R	X	X	X
BRM1 - Granule loss or vegetation resulting in deterioration of shingle.	D/P/R R	X	X	X
BRM2 - Wind, traffic, or hail damage to tabs only. Missing tabs.	D/P/R R	X	X	X
M&R activities as required:				
BRH1 - Replace isolated damaged shingles. Extensive problems may require roof replacement.	D/P R	S	S	N/S S
BRM1 - Replace isolated broken shingles. Extensive damage may require roof replacement.	D/P R	S	S	N/S S
BRM2 - Replace isolated broken shingles. Extensive damage may require roof replacement.	D/P R	S	S	N/S S

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

BLISTERING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
BLM1 - Open blister on shingle	D/P/R R	X	X	X
M&R activities as required:				
BLM1 - Apply mastic.	D/P/R R	C	C	C

LOOSE TABS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
LTM1 - Tab seal strip has not adhered to underlying shingle.	D/P/R R	X	X	X
M&R activities as required:				
LTM1 - Carefully lift loose tab, place plastic cement underneath tabs, and press in place.	D/P R	C	C	C C

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

ICE DAMS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
IDM1 - Damage to eave and/or lowest courses of shingles which is attributable to ice damming.	D/P/R R	X	X	X
M&R activities as required:				
IDM1 - Repair of this problem may require place- ment of an ice shield under the shingles from the eave extending 3 to 6 feet up slope. Ventilation improve- ments may also be desirable	D/P R	C	C	C C

DEBRIS AND VEGETATION	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
DVM2 - Foreign objects on the roof or gutters.	D/P/R R	X	X	X
M&R activities as required:				
DVM2 - Remove foreign objects from the roof.	D/P R	C	C C	C C

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
	When to	D<30d	D<1yr	D>1yr
IMPROPER EQUIPMENT SUPPORTS (INCLUDES WATER DIVERTERS)	Inspt			
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
EQH1 - Movement of support has caused damage to the shingles.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
EQM1 - The equipment is bolted through the shingles and the bolts appear not to be sealed.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
EQH1 - Repair damaged shingles under equipment support and install flashing device appropriate to the problem.	D/P R	C	C	C C
-----	-----	-----	-----	-----
EQM1 - Caulk unflashed penetrations with elasto- metric sealant.	D/P R	C	C	C C
-----	-----	-----	-----	-----

ROOFING SYSTEM

ROOF DRAINAGE

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GUTTERS & DOWNSPOUTS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Clogged gutter or downspout	D/P/R R	X	X	X
Secured to building	D/P/R R	X	X	X
Water tight	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Stains & discoloration	R	X	X	X
Broken or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

ROOFING SYSTEM

ROOF DRAINAGE

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Remove debris from gutter	D/P		C	C
or downspout	R	C	C	C
-----	-----	-----	-----	-----
Secure gutter and downspout	D/P		C	C
to building	R	C	C	C
-----	-----	-----	-----	-----
Adjust to make water tight	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Remove corrosion	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing	D/P		C	C
sections	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains	R	C	C	C
& discoloration				
-----	-----	-----	-----	-----
Prepare surfaces & paint	D/P			C
(when previously painted)	R	C	C	C
=====	=====	=====	=====	=====

ROOFING SYSTEM

ROOF DRAINAGE

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

FLASHING & COUNTERFLASHING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
Misaligned sections	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
M&R activities as required:				
Repair cracks, chips, holes dents, & gouges	D/P/R R	S	N/S S	N/S S
Secure loose sections & fasteners	D/P/R R	C	C C	C C
Replace broken or missing sections & fasteners	D/P/R R	S	N/S S	N/S S

ROOFING SYSTEM

ROOF DRAINAGE

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
MCH1 - Repair displaced flashing or install new flashing.	D/P R	S	N/S S	N/S S
MCH2 - Replace missing joint covers on metal coping cap and reattach.	D/P/R R	S	N/S S	N/S S
MCM1 - Clean and patch holes in metal cap flashing and coat entire surface with corrosion resistant paint.	D/P R	C	C C	C C
MCM2 - Reseal failed joints in metal coping cap and reattach.	D/P R	C	C C	C C
MCM3 - Remove faulty sealant at reglet or top of counterflashing and reseal.	D/P R	C	C C	C C
MCM4 - Reinstall displaced counterflashing into its original position and fasten.	D/P R	C	C C	C C
MCM5 - Add extension or replace counterflashing to cover top of step flashing.	D/P R	S	N/S S	N/S S
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

FLASHED PENETRATIONS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
FPH1 - Holes, cuts, or tears in flashing sleeve or metal curb.	D/P/R R	X	X	X
FPH2 - No flashing sleeve present (where required).	D/P/R R	X	X	X
FPM3 - Top of flashing sleeve is not sealed or rolled into the existing plumbing vent stack. Clamping band is loose or missing (where required).	D/P/R R	X	X	X
FPM4 - The sleeve or umbrella is open or no umbrella is present (where required).	D/P/R R	X	X	X
FPM5 - Corrosion of metal.	D/P/R R	X	X	X
M&R activities as required:				
FPH1 - Remove damaged flashing sleeves or curbs and replace.	D/P R	S	N/S S	N/S S
FPH2 - Install missing flashing sleeves on flashed penetrations.	D/P R	S	S	N/S S

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
FPM3 - Seal top of flashing sleeves around flashed penetrations.	D/P R	C	C C	C C
-----	-----	-----	-----	-----
FPM4 - Install an umbrella or weather hood on flashed penetrations.	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
FPM5 - Remove surface corrosion, prime and coat metal flashing with corrosion resistant paint.	D/P R	C	C C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
VALLEY FLASHING	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
VFH1 - For metal valley flashings, corrosion holes through the metal.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
VFH2 - For mineral surfaced roll roofing valleys, end laps are separated or not sealed down.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
VFH3 - Shingles have separated from valleys.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
VFH1 - Isolated holes can be repaired with caulk or sheet metal and caulk. Extensive deterioration may require replacement of valley flashing.	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
VFH2 - Apply liberal amounts of plastic cement between plies.	D/P R	C	C	C C
-----	-----	-----	-----	-----
VFH3 - Apply liberal amounts of plastic cement between shingles and flashing.	D/P R	C	C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
CAH1 - Deteriorated, split, or missing caulk on flashing or counterflashing.	D/P/R R	X	X	X
M&R activities as required:				
CAH1 - Remove old caulk, clean, and apply elastomeric sealant.	D/P R	C	C	C C

CLAWING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
CLM1 - Shingle is clawed and center of tab is raised more than 1/4 inch.	D/P/R R	X	X	X
M&R activities as required:				
CLM1 - No repair. Extensive clawing may require roof replacement in the near future.	R	S	S	S

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
IMPROPER NAILING / NAIL REJECTION	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
INM1 - Nails pushing up on shingle above head.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
INM1 - Remove accessible nails (under tab), seal hole with plastic cement, and renail in new location.	D/P R	C	C	C C
=====	=====	=====	=====	=====

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

BREAKAGE/DAMAGE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
BRH1 - Breakage or deterioration of shingles extending beyond the tabs.	D/P/R R	X	X	X
BRM1 - Granule loss or vegetation resulting in deterioration of shingle.	D/P/R R	X	X	X
BRM2 - Wind, traffic, or hail damage to tabs only. Missing tabs.	D/P/R R	X	X	X
M&R activities as required:				
BRH1 - Replace isolated damaged shingles. Extensive problems may require roof replacement.	D/P R	S	S	N/S S
BRM1 - Replace isolated broken shingles. Extensive damage may require roof replacement.	D/P R	S	S	N/S S
BRM2 - Replace isolated broken shingles. Extensive damage may require roof replacement.	D/P R	S	S	N/S S

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

BLISTERING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
BLM1 - Open blister on shingle	D/P/R R	X	X	X
M&R activities as required:				
BLM1 - Apply mastic.	D/P/R R	C	C	C

LOOSE TABS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
LTM1 - Tab seal strip has not adhered to underlying shingle.	D/P/R R	X	X	X
M&R activities as required:				
LTM1 - Carefully lift loose tab, place plastic cement underneath tabs, and press in place.	D/P R	C	C	C C

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

ICE DAMS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
IDM1 - Damage to eave and/or lowest courses of shingles which is attributable to ice damming.	D/P/R R	X	X	X
M&R activities as required:				
IDM1 - Repair of this problem may require place- ment of an ice shield under the shingles from the eave extending 3 to 6 feet up slope. Ventilation improve- ments may also be desirable	D/P R	C	C	C C

DEBRIS AND VEGETATION	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
DVM2 - Foreign objects on the roof or gutters.	D/P/R R	X	X	X
M&R activities as required:				
DVM2 - Remove foreign objects from the roof.	D/P R	C	C C	C C

ROOFING SYSTEM

SHINGLES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	When	D<30d	D<1yr	D>1yr
IMPROPER EQUIPMENT SUPPORTS (INCLUDES WATER DIVERTERS)	to Inspt			
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
EQH1 - Movement of support has caused damage to the shingles.	D/P/R R	X	X	X
-----	-----	-----	-----	-----
EQM1 - The equipment is bolted through the shingles and the bolts appear not to be sealed.	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
EQH1 - Repair damaged shingles under equipment support and install flashing device appropriate to the problem.	D/P R	C	C	C
-----	-----	-----	-----	-----
EQM1 - Caulk unflashed penetrations with elasto- metric sealant.	D/P R	C	C	C
-----	-----	-----	-----	-----

ROOFING SYSTEM

ROOF DRAINAGE

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GUTTERS & DOWNSPOUTS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Clogged gutter or downspout	D/P/R R	X	X	X
Secured to building	D/P/R R	X	X	X
Water tight	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Stains & discoloration	R	X	X	X
Broken or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

ROOFING SYSTEM

ROOF DRAINAGE

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Remove debris from gutter	D/P		C	C
or downspout	R	C	C	C
-----	-----	-----	-----	-----
Secure gutter and downspout	D/P		C	C
to building	R	C	C	C
-----	-----	-----	-----	-----
Adjust to make water tight	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Remove corrosion	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing	D/P		C	C
sections	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains	R	C	C	C
& discoloration				
-----	-----	-----	-----	-----
Prepare surfaces & paint	D/P			C
(when previously painted)	R	C	C	C
=====	=====	=====	=====	=====

ROOFING SYSTEM

ROOF DRAINAGE

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

FLASHING & COUNTERFLASHING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
Misaligned sections	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
M&R activities as required:				
Repair cracks, chips, holes dents, & gouges	D/P/R R	S	N/S S	N/S S
Secure loose sections & fasteners	D/P/R R	C	C C	C C
Replace broken or missing sections & fasteners	D/P/R R	S	N/S S	N/S S

Appendix E: Inspection and M&R Checklists for Exterior Closure

The inspection and M&R procedures are designed to identify and locate expected deterioration to architectural and structural components associated with the historic building exterior. One emphasis of these procedures is to preserve the building envelope. The purpose is to keep moisture, vermin, insects, and unauthorized personnel out of the buildings. Specifically, these procedures are designed to sustain the historic building at a predetermined condition level and preserve its historic nature throughout its layaway period. For instance, if an inspection reveals cracked, broken, loose, or crumbling mortar, these procedures will call for the joint to be repaired by cleaning and tuckpointing the mortar. This approach will keep moisture from damaging the building and its contents. Another emphasis of these procedures is on the correction of safety defects that may result in injury to personnel who need to work or move through the area.

If breaches in the building envelope are found during routine inspections, or from other sources such as the provost marshal, a correction should be accomplished as soon as possible. This is due to the seriousness of such breaches: they will cause accelerated deterioration if not corrected. Other items on the checklist that may be discovered can be accomplished through scheduled routine M&R.

To preserve the historic nature of the interior of a building, the installation of window vents in the exterior closure system is a necessity. The purpose of these vents was discussed in Chapter 4.

Upon reactivation, certain habitability (quality-of-life) tasks should be accomplished. These include the washing of windows, repairing of safety defects, and other chores that would serve to "spruce up" the area.

The distresses such as cracking may be symptomatic of structural problems. This topic is addressed in Appendix C.

General Notes on Painting

When corrosion is removed from a surface, that surface must receive touch-up paint.

Existing paint coatings may contain lead, which is a hazardous material. Special precautions must be taken when working with or around such coatings. See Volume I for details.

If pitting corrosion is present, remove corrosion, spot prime, and topcoat the entire surface. If pitting corrosion continues, determine the cause of corrosion and fix the condition before performing any further M&R.

Exterior Metal

Perform surface preparation of general corrosion covering 1 percent or more, and any pitted corrosion.

Exterior Concrete

Perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

Exterior Wood

Where noted, perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

Exterior Concrete Masonry Unit

Perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

Checklist Contents

The exterior closure system consists of the architectural elements of the building envelope, plus the exterior elements immediately adjacent to the building. Its components are exterior perimeter, exterior wall, decking, exterior ceilings, windows and louvers, doors, decorations, and stairs. Only the subcomponents listed below have checklists.

Exterior Ceiling

Concrete Ceiling
Gypsum Board Ceiling

Exterior Decking

Brick Masonry Unit
Concrete
Concrete Masonry Unit
Wood

*Exterior Decorations**Exterior Doors*

Aluminum Doors and Frames; Glass Doors and Frames
Caulking
Door Hardware
Glass in Doors
Hollow Metal Doors and Frames; Steel Doors and Frames
Louvers in Doors
Metal Coiling Doors and Metal Sectional Overhead Doors
Screen Doors
Sectional Overhead Doors: Wood Panels
Steel and Glass Doors and Frames
Wood Doors and Frames

Exterior Perimeter

Area Drains and Catch Basins
Caulking
Concrete Stairs and Retaining Walls
Dock Bumpers
Exterior Signs
Finish Grade
Metal Grates
Security Fencing
Sidewalks, Stoops, and Steps
Steel Guardrails, Handrails, and Stairs

Trees and Shrubs

Vehicle Bumper Guards: Steel, Wood, and Concrete

Wood Guardrails, Handrails, and Stairs

Exterior Stairs

Exterior Wall

Adobe Unit Masonry

Brick Masonry Units

Caulking

Cementitious Coating

Concrete Masonry Units and Glass Block Units

Concrete Surfaces

Exterior Ceramic Tile

Identifying Devices: Exterior Signs, Lettering, and Attachments

Lintels and Sills: Steel, Precast Concrete, and Reinforced Concrete Masonry Units

Metal Cladding and Panels

Miscellaneous Metal: Ladders, Security Grilles, Corner Guards, Flagpoles, Metal Fascia and Soffits, Metal Canopies, and Supports

Terra Cotta Masonry

Vinyl Cladding

Wood Cladding

Exterior Windows and Louvers

Aluminum Windows

Caulking

Glass and Glazing

Metal-Clad Wood Windows

Metal Louvers and Grilles

Steel Windows

Vinyl-Clad Wood Windows

Window Hardware

Window Screens

Wood Windows

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

SIDEWALKS, STOOPS, & STEPS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Uneven settlement	D/P/R R	X	X	X
Tripping & slipping hazards	D/P/R	X	X	X
Exposed reinforcing	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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=====	=====	=====	=====	=====
M&R activities as required				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace damaged sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace sections that cause tripping hazards; clean off slipping hazards	D/P/R	S	S	S
-----	-----	-----	-----	-----
Clean rebar & adjacent concrete; coat rebar & patch	D/P R	C	C	C
-----	-----	-----	-----	-----
Replace rebar; clean adjacent concrete, patch area	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Repair or replace damaged expansion joints	D/P R	C	C	C C
=====	=====	=====	=====	=====

=====	=====	=====	=====	=====
FINISH GRADE	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Slope towards building	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Water accumulation at building	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required				
=====	=====	=====	=====	=====
Slope grade away from building	D/P/R R	C	C C	C C
-----	-----	-----	-----	-----
Provide dam or trench to prevent accumulation at building	D/P/R R	C	C C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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TREES & SHRUBS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Building contact by trees, branches, shrubs, or vegetative growth	D/P/R R	X	X	X
M&R activities as required				
Remove or trim all tree, shrub, & vegetative growth in contact with building	D/P/R R	C	C	C

CONCRETE STAIRS & RETAINING WALLS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Movement	D/P/R R	X	X	X
Tripping & slipping hazards	D/P/R	X	X	X
Exposed reinforcing	D/P/R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Clogged weep holes	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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=====	=====	=====	=====	=====
M&R activities as required				
=====	=====	=====	=====	=====
Repair cracks, chips, & holes	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace damaged sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace sections that cause tripping hazards; clean off slipping hazards	D/P/R	S	S	S
-----	-----	-----	-----	-----
Clean rebar & adjacent concrete; coat rebar, patch area	D/P R	C	C	C
-----	-----	-----	-----	-----
Replace rebar; clean adjacent concrete, patch area	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Repair or replace damaged expansion joints	D/P R	C	C	C
-----	-----	-----	-----	-----
Consult with engineer for movement correction procedure	D/P R	C	C	C
-----	-----	-----	-----	-----
Rod out clogged weep holes	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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STEEL GUARDRAILS, HANDRAILS, & STAIRS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, dents, & deformation	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P R	X	X	X X
M&R activities as required:				
Repair cracks, holes, dents, & deformation	D/P R	S	S	N/S S
Remove corrosion	D/P R	C	C	C C
Secure loose sections & fasteners	D/P R	C	C C	C C
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Clean off surfaces stains & discoloration	D/P R	C	C	C C
Clean surfaces	R	C	C	C
Prepare surface & paint (when previously painted)	D/P R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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WOOD GUARDRAILS, HANDRAILS, & STAIRS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Gouges	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Insect infestation	D/P/R R	X	X	X
Fungal growth	D/P/R		X	X
Warped sections	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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M&R activities as required:				
Seal cracks, splits, & holes	D/P R	C	C	C C
Repair or replace gouged areas	D/P R	S	S	N/S S
Replace rotted sections	D/P R	S	N/S S	N/S S
Replace warped sections	D/P R	S	S	N/S S
Secure loose sections & fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Eradicate insect infestation	D/P R	C	C	C C
Clean off fungus growth	D/P R	C	C	C C
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare surface & paint (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

METAL GRATES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, dents, & deformation	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P R	X	X	X
M&R activities as required:				
Repair cracks, dents, & deformations	D/P R	S	S	N/S S
Remove corrosion	D/P	C	C	C C
Secure loose sections & fasteners	D/P R	C	C C	C C
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Clean off surface stains & discoloration	R	C	C	C
Prepare surface & paint (when previously painted)	D/P R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

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CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose caulk	D/P/R R	X	X	X
Missing caulk	D/P/R R	X	X	X
Eroded caulk	D/P/R R	X	X	X
M&R activities as required:				
Remove loose, eroded, or damaged caulk, clean surfaces, recaulk	D/P R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

AREA DRAINS & CATCH BASINS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Clogging debris	D/P/R R	X	X	X
Standing water	D/P/R R	X	X	X
Cracks & deformation	D/P/R R	X	X	X
Loose sections	D/P/R R	X	X	X
Loose, broken, or missing sections	D/P/R R	X	X	X
M&R activities as required:				
Remove debris	D/P R	C	C C	C C
Rout out drain	D/P R	C	C C	C C
Repair cracks & deformation	D/P R	S	S	N/S S
Secure loose sections	D/P R	C	C C	C C
Replace broken or missing sections	D/P R	S	N/S S	N/S S

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
VEHICLE BUMPER GUARDS: STEEL, WOOD, & CONCRETE	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, dents, & deformation	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks, dents, & deformation	D/P R	S	S	N/S S
Remove corrosion	D/P R	S	S	N/S S
Secure loose sections & fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Prepare surface & paint (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

NOTE: D = Deactivation X = Item to be inspected d = days
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DOCK BUMPERS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P R	X	X	X
M&R activities as required:				
Remove wood/steel bumpers	D/P R	C	C	C C
Reinstall wood/steel bumpers	D/P R	C	C	C C
Secure loose sections & fasteners	D/P R	C	C C	C C
Replace rotted, broken, or missing sections & fasteners	D/P R	S	S	N/S S
Prepare surface & paint (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR PERIMETER

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EXTERIOR SIGNS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose, broken, missing, or damaged signs	D/P/R R	X	X	X
M&R activities as required:				
Repair or replace signs	D/P R	S	S	N/S S

SECURITY FENCING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Holes & penetrations	D/P/R R	X	X	X
Continuity of barbed wire or tape	D/P/R R	X	X	X
Stability of vertical supports	D/P/R R	X	X	X
M&R activities as required:				
Replace damaged fence area or barbed wire/tape	D/P R	C	C	C
Reset vertical support	D/P R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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CONCRETE SURFACES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Efflorescence; locate source of water penetration	D/P/R R	X	X	X
Exposed reinforcing	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

M&R activities as required:				
Repair cracks & holes	D/P R	S	N/S S	N/S S
Repair chips & gouges	D/P R	S	S	N/S S
Repair spalled or scaled area	D/P R	S	S	N/S S
Clean rebar & adjacent concrete; coat rebar, patch area	D/P R	S	N/S S	N/S S
Replace rebar; clean adjacent concrete, patch area	D/P R	S	N/S S	N/S S
Repair expansion joints	D/P R	C	C	C C
Clean off surface stains & discoloration	R	C	C	C
Clean off efflorescence	D/P R	C	C	C C
Prepare & paint surfaces (when previously painted)	D/P R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

CEMENTITIOUS COATING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Efflorescence; locate source of water penetration	D/P/R R	X	X	X
Damaged expansion joints	D/P/R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair chips & gouges	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair expansion joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean off efflorescence	D/P/R			C
	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces (when previously painted)	D/P			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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CONCRETE MASONRY UNITS & GLASS BLOCK UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Broken or missing units	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling mortar	D/P/R R	X	X	X
Missing mortar	D/P/R R	X	X	X
Bowing or bulging	D/P/R R	X	X	X
Out of plumb	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Efflorescence; locate source of water penetration	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Clogged weep holes	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair chips & gouges	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace broken or missing units	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair/tuckpoint joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair/tuckpoint mortar gaps	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Tie wall back to main structure	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Reconstruct failed area	D/P/R	C	C	C
-----	-----	-----	-----	-----
Repair damaged expansion joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean-out weep holes	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean off efflorescence	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces (when previously painted)	D/P			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

BRICK MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Broken or missing units	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling mortar	D/P/R R	X	X	X
Missing mortar	D/P/R			X
Bowing or bulging	D/P/R R	X	X	X
Out of plumb	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Efflorescence; locate source of water penetration	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Control joints	D/P/R R	X	X	X
Clogged weep holes	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair chips & gouges	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace broken or missing units	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair/tuckpoint joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair/tuckpoint mortar gaps	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Tie wall back to main structure	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Reconstruct failed area	D/P	C	C	C
	R			
-----	-----	-----	-----	-----
Repair damaged expansion joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean-out weep holes	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean control joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean off efflorescence	D/P			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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ADOBE UNIT MASONRY	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Broken or missing units	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling mortar	D/P/R R	X	X	X
Missing mortar	D/P/R	X	X	X
Bowing or bulging	D/P/R R	X	X	X
Out of plumb	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Control joints	D/P/R R	X	X	X
Clogged weep holes	D/P/R R	X	X	X
Excessive weathering	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Repair chips & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace broken or missing units	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair/tuckpoint joints	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Repair/tuckpoint mortar gaps	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Tie wall back to main structure	D/P R	C	C	C C
-----	-----	-----	-----	-----
Reconstruct failed area	D/P R	C	C	C C
-----	-----	-----	-----	-----
Repair damaged expansion joints	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean-out weep holes	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean control joints	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Replace excessively weathered units	D/P/R R	S	S	N/S S
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

TERRA COTTA MASONRY	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Broken, loose, or missing units	D/P/R R	X	X	X
Spalling, scaling, and crazing of the glazing	D/P/R R	X	X	X
Cracked, broken, loose, crumbling, or missing mortar	D/P/R R	X	X	X
Bowing or bulging	D/P/R R	X	X	X
Out of plumb	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Efflorescence; locate source of water penetration	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Control joints	D/P/R R	X	X	X
Clogged weep holes	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

M&R activities as required:				
Repair cracks & holes	D/P R	S	N/S S	N/S S
Repair chips & gouges	D/P R	S	S	N/S S
Resecure loose units	D/P/R R	C	C	C C
Replace broken or missing units	D/P R	S	N/S S	N/S S
Repair spalled, scaled, and crazed areas	D/P R	S	S	N/S S
Remove cracked, broken, loose, or crumbling mortar; repair/tuckpoint joints	D/P R	S	S	N/S S
Tie wall back to main structure	D/P R	C	C	C C
Reconstruct failed area	D/P R	C	C	C C
Repair damaged expansion joints	D/P R	C	C	C C
Clean-out weep holes	D/P R	C	C	C C
Clean control joints	D/P R	C	C	C C
Clean off surface stains & discoloration	R	C	C	C
Clean off efflorescence	D/P R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

EXTERIOR CERAMIC TILE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, & gouges	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Loose, broken, or missing tiles	D/P/R R	X	X	X
Loose or missing grout	D/P/R R	X	X	X
M&R activities as required:				
Repair cracks, chips, holes, & gouges	D/P R	S	N/S S	N/S S
Grout-in loose tiles	D/P R	C	C C	C C
Replace broken or missing tiles	D/P R	S	N/S S	N/S S
Remove loose grout, regrout joints	D/P R	S	S	N/S S
Clean off surface stains & discoloration	R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

METAL CLADDING & METAL PANELS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Corrosion	D/P/R R	X	X	X
Deformed sections	R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch small cracks & holes;	D/P		N/S	N/S
replace sections with large	R	S	S	S
cracks & holes				
-----	-----	-----	-----	-----
Replace sections with	R	S	S	S
dents or gouges				
-----	-----	-----	-----	-----
Remove corrosion	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Replace deformed sections	R	C	C	C
-----	-----	-----	-----	-----
Secure loose sections &	D/P		C	C
fasteners	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing	D/P		N/S	N/S
sections & fasteners	R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains	R	C	C	C
& discoloration				
-----	-----	-----	-----	-----
Prepare & paint surfaces				C
(when previously painted)	D/P/R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

VINYL CLADDING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Deformed sections	R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
M&R activities as required:				
Patch small cracks & holes; replace sections with large cracks & holes	D/P R	S	N/S S	N/S S
Replace deformed sections	R	S	S	S
Secure loose sections & fasteners	D/P R	C	C C	C C
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Clean off surface stains & discoloration	R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WOOD CLADDING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Gouges	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Insect infestation	D/P/R R	X	X	X
Fungal growth	D/P/R R	X	X	X
Warped sections	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Seal cracks, splits, & holes	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Repair or replace gouged areas	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace rotted sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Replace warped sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Secure loose sections & fasteners	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P/R R	C	C C	C C
-----	-----	-----	-----	-----
Clean off fungus growth	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Clean off surfaces stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces (when previously painted)	D/P/R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

LINTELS & SILLS: STEEL, PRECAST CONCRETE, & REINFORCED CMU	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Corrosion	D/P/R R	X	X	X
Cracks, chips, holes, & gouges	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Sagging, displacement or misalignment	D/P/R R	X	X	X
M&R activities as required:				
Remove minor corrosion	D/P R	C	C	C
Major corrosion, replace member	D/P R	S	N/S S	N/S S
Repair or replace members with cracks, chips, holes, or gouges	D/P R	S	N/S S	N/S S
Realign & stabilize	D/P R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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MISCELLANEOUS METAL, LADDERS, SECURITY GRILLES, CORNER GUARDS, FLAGPOLES, METAL FASCIA & SOFFITS, METAL CANOPIES & SUPPORTS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Corrosion	D/P/R R	X	X	X
Deformed sections	R	X	X	X
Misalignment; detached sections	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch small cracks & holes;	D/P		N/S	N/S
replace sections with large	R	S	S	S
cracks & holes				
-----	-----	-----	-----	-----
Replace sections with	D/P		N/S	N/S
dents or gouges	R	S	S	S
-----	-----	-----	-----	-----
Remove corrosion	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Replace deformed sections	R	S	S	S
-----	-----	-----	-----	-----
Align & attach sections	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Secure loose sections &	D/P		C	C
fasteners	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing	D/P		N/S	N/S
sections & fasteners	R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains	R	C	C	C
& discoloration				
-----	-----	-----	-----	-----
Prepare & paint surfaces				C
(when previously painted)	D/P/R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

IDENTIFYING DEVICES: EXTERIOR SIGNS, LETTERING, & ATTACHMENTS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
M&R activities as required:				
Secure loose sections & fasteners	D/P R	C	C	C
Repair or replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Prepare & paint surfaces (when previously painted)	D/P R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WALL SURFACES

NOTE: D = Deactivation X = Item to be inspected d = days
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CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose caulk	D/P/R R	X	X	X
Missing caulk	D/P/R R	X	X	X
Eroded caulk	D/P/R R	X	X	X
M&R activities as required:				
Remove loose, eroded, or damaged caulk, clean surfaces, recaulk	D/P R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
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GLASS & GLAZING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Broken or missing glass	D/P/R R	X	X	X
Broken or missing glazing	D/P/R R	X	X	X
Double glazing seal failure	R	X	X	X
M&R activities as required:				
Replace broken or missing glass and glazing, & sealed units	D/P R	S	N/S S	N/S S
If glass or glazing broken or missing, board up opening	D/P R	C C	C C	C C
Clean surfaces	D/P R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

STEEL WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Warping & racking	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Stains & discoloration	R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

M&R activities as required:				
Repair cracks & holes	D/P R	S	S	N/S S
Repair damaged surfaces	R	C	C	C
Remove corrosion	D/P R	C	C C	C C
Secure loose sections & loose or missing fasteners	D/P R	C	C C	C C
Replace broken or missing sections	D/P R	S	N/S S	N/S S
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

ALUMINUM WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair damaged surfaces	R	C	C	C
-----	-----	-----	-----	-----
Remove corrosion	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Secure loose sections & loose or missing fasteners	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare surfaces & paint (when previously painted)	D/P/R			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

VINYL CLAD WOOD WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, & holes	D/P/R R	X	X	X
Open joints	D/P/R R	X	X	X
Surface damage; detachment	D/P/R R	X	X	X
Decayed wood core	D/P/R R	X	X	X
Staining & discoloration	D/P/R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, & holes	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace decayed sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Secure loose sections & loose or missing fasteners	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Seal open joints	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

METAL CLAD WOOD WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Open joints	D/P/R R	X	X	X
Decayed wood core	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Surface damage; detachment	D	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, holes, dents, & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace decayed sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Secure loose sections & loose or missing fasteners	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Seal open joints	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WOOD WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Warp	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Rot	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Fungal growth	D/P/R R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Open joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks, splits, & holes	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Refinish surfaces	R	S	S	S
-----	-----	-----	-----	-----
Remove rot & replace sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Secure loose sections & loose or missing fasteners	D/P R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Tighten open joints	D/P R	C	C	C C
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean off fungus growth	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

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WINDOW HARDWARE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Broken or missing components (stays, handles, balances, etc.)	D/P/R R	X	X	X
Window locks	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
Operation of balances	R	X	X	X
M&R activities as required:				
Repair or replace broken or missing components	D/P R	S	S	N/S S
Repair or replace window locks	D/P R	S	S	N/S S
Restore to proper working order, eg., unsticking a wood window	R	C	C	C
Remove corrosion	D/P R	C	C	C C
Refinish hardware	R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

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METAL LOUVERS & METAL GRILLES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Secure screening	R	X	X	X
Loose sections & loose or missing fasteners	R	X	X	X
Broken or missing sections	R			X
Surface coat damage	D/P/R R	X	X	X
M&R activities as required:				
Repair cracks, holes, dents, & gouges	D/P R	S	S	N/S S
Remove corrosion	D/P R	S	S	N/S S
Reattach and seal screening	R	C	C	C
Secure loose sections & loose or missing fasteners	R	C	C	C
Replace broken or missing sections	D/P/R R	S	S	N/S S
Clean surfaces; clean screens to keep air flow	R	C	C	C
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

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WINDOW SCREENS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose screens	D/P/R R	X	X	X
Damaged screens	R	X	X	X
Corrosion	R	X	X	X
Surface coat damage	R	X	X	X
M&R activities as required:				
Remove screens, store in building	D/P	C	C	C
Remove loose screens, store in building	D/P	C	C	C
Repair or replace damaged screens	D/P R	S	S	N/S S
Remove corrosion	D/P R	C	C	C C
Refinish surfaces	R	C	C	C
Clean surfaces	R	C	C	C
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR WINDOWS AND LOUVERS

NOTE: D = Deactivation X = Item to be inspected d = days
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CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose caulk	R	X	X	X
Missing caulk	D/P/R R	X	X	X
Eroded caulk	D/P/R	X	X	X
M&R activities as required:				
Remove loose, eroded, or damaged caulk, clean surfaces, recaulk	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
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=====	=====	=====	=====	=====
HOLLOW METAL DOORS & FRAMES & STEEL DOORS & FRAMES	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Surface abrasion, dents, gouges, & chips	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
Corrosion	D/P/R R	X	X	X
Stains & discoloration	R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
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M&R activities as required:				
Repair cracks & holes dents, & gouges	D/P R	S	S	N/S S
Repair damaged surfaces	D/P R	S	S	N/S S
Repair or replace doors & frames	R	S	S	S
Remove corrosion	D/P R	C	C	C C
Secure loose sections & fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	S	N/S S
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
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=====	=====	=====	=====	=====
METAL COILING DOORS & MTL SECTIONAL OVERHEAD DRS	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks & holes	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface abrasion, dents, gouges, & chips	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Malfunction or misalignment	R	X	X	X
-----	-----	-----	-----	-----
Corrosion	R	X	X	X
-----	-----	-----	-----	-----
Stains & discoloration	R	X	X	X
-----	-----	-----	-----	-----
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P			N/S
dents, & gouges	R	S	S	S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair or replace doors & frames & operating mechanism	R	S	S	S
-----	-----	-----	-----	-----
Remove corrosion	R	C	C	C
-----	-----	-----	-----	-----
Secure loose sections & fasteners	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing sections & fasteners	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces (when previously painted)	D/P/R			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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SECTIONAL OVERHEAD DOORS: WOOD PANELS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Surface abrasion, gouges, & chips	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
Warp	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Staining & discoloration	D/P/R	X	X	X
Insect infestation	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, splits, & holes	D/P R	S	S	N/S S
Repair damaged surfaces	R	C	C	C
Repair or replace doors, panels, or frames	D/P R	S	S	N/S S
Remove & replace rotted doors, panels, or frames	D/P R	S	N/S S	N/S S
Eradicate insect infestation	D/P R	C	C C	C C
Secure loose sections & fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	S	N/S S
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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WOOD DOORS & FRAMES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Surface abrasion, gouges, & chips	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
Warp	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Insect infestation	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, splits, & holes	D/P R	S	S	N/S S
Repair damaged surfaces	R	C	C	C
Repair or replace doors, panels, or frames	D/P R	S	S	N/S S
Remove & replace rotted doors, panels, or frames	D/P R	S	N/S S	N/S S
Eradicate insect infestation	D/P R	C	C	C C
Secure loose sections & fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	S	N/S S
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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STEEL & GLASS DOORS & FRAMES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R	X	X	X
Surface abrasion; scratches	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
Corrosion	D/P/R R	X	X	X
Stains & discoloration	R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Cracked, broken, or missing glass	D/P/R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Repair or replace doors & frames	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove corrosion	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Secure loose sections & fasteners	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing sections & fasteners	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace broken or missing glass	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
If broken, remove glass & board up opening; if missing, board up opening	D	C	C	C
	D/P		C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces when previously painted)	D/P/R			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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ALUMINUM & GLASS DOORS & FRAMES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Surface abrasion; scratches	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
Corrosion	D/P/R R	X	X	X
Stains & discoloration	R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Cracked, broken, or missing glass	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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M&R activities as required:				
Repair cracks & holes	D/P R	S	S	N/S S
Repair damaged surfaces	R	C	C	C
Repair or replace doors & frames	D/P R	S	S	N/S S
Remove corrosion	D/P R	S	S	N/S S
Secure loose sections & fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	S	N/S S
Replace broken or missing glass	D/P R	S	S	N/S S
If broken, remove glass & board up opening; if missing, board up opening	D/P D	C	C	C C
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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SCREEN DOORS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Damaged doors	R	X	X	X
Corrosion	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
M&R activities as required:				
Remove screen doors, store in building	D	C	C	C
Repair or replace damaged screen doors	D/P R	S	S	N/S S
Remove corrosion	D/P R	C	C	C C
Refinish surfaces	R	C	C	C
Clean surfaces	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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GLASS IN DOORS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracked, broken, or missing glass	D/P/R R	X	X	X
Broken or missing seals or gaskets	D/P/R R	X	X	X
M&R activities as required:				
Replace cracked, broken, or missing glass	D/P R	S	S	N/S S
If broken, remove glass & board up opening; if missing, board up opening	D/P D	C	C	C
Replace broken or missing seals or gaskets	D/P R	C	C	C C
If seals or gaskets broken or missing, board up opening	D/P D	C	C	C
Clean surfaces	R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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=====	=====	=====	=====	=====
LOUVERS IN DOORS	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Secure screening	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
Repair crack, holes, dents, & gouges	D/P R	S	S	N/S S
Remove corrosion	D/P R	C	C	C C
Reattach and seal screening	D/P R	C	C	C C
Secure loose sections & fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Clean surfaces; clean screens to keep clear air flow	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

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DOOR HARDWARE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Functioning hinges	R	X	X	X
Functioning door locks	R	X	X	X
Broken or missing components	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
M&R activities as required:				
Oil hinges	R	C	C	C
Repair or replace door locks	R	S	S	S
Repair or replace components	D/P R	S	S	N/S S
Remove corrosion	R	C	C	C
Clean surfaces	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P/R R	C	C	C C

EXTERIOR CLOSURE SYSTEM

EXTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
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CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose caulk	D/P/R R	X	X	X
Broken or missing caulk	D/P/R R	X	X	X
Eroded caulk	D/P/R R	X	X	X
M&R activities as required:				
Remove loose, broken, or eroded caulk	R	C	C	C
Clean surfaces & recaulk	R	C	C	C

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

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CONCRETE SURFACES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Efflorescence	D/P/R R	X	X	X
Exposed reinforcing	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

NOTE: D = Deactivation X = Item to be inspected d = days
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 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair chips & gouges	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean rebar & adjacent concrete; coat rebar, patch area	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace rebar; clean adjacent concrete, patch area	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair expansion joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean off efflorescence	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces (when previously painted)	D/P			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

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BRICK MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Broken or missing units	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling mortar	D/P/R R	X	X	X
Missing mortar	D/P/R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Efflorescence	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Control joints	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

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=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair chips & gouges	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace broken or missing units	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair/tuckpoint joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair/tuckpoint mortar gaps	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Reconstruct failed area	D/P	C	C	C
	R			
-----	-----	-----	-----	-----
Repair damaged expansion joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean control joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean off efflorescence	D/P			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONCRETE MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Broken or missing units	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling mortar	D/P/R R	X	X	X
Missing mortar	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Efflorescence	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair chips & gouges	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace broken or missing units	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair/tuckpoint joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair/tuckpoint mortar gaps	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Reconstruct failed area	D/P/R	C	C	C
-----	-----	-----	-----	-----
Repair damaged expansion joints	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean off efflorescence	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces (when previously painted)	D/P			C
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WOOD	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Gouges	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Insect infestation	D/P/R R	X	X	X
Fungal growth	D/P/R R	X	X	X
Warped sections	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR DECKING

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Seal cracks, splits, & holes	D/P R	S	N/S S	N/S S
Repair or replace gouged areas	D/P R	S	S	N/S S
Replace rotted sections	D/P R	S	N/S S	N/S S
Replace warped sections	D/P R	S	S	N/S S
Secure loose sections & fasteners	D/P R	C	C C	C C
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
Eradicate insect infestation	D/P/R R	C	C C	C C
Clean off fungus growth	D/P R	C	C C	C C
Clean off surfaces stains & discoloration	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P/R	C	C	C C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONCRETE CEILINGS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Exposed reinforcing	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X

EXTERIOR CLOSURE SYSTEM

EXTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean rebar & adjacent concrete; coat rebar, patch area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace rebar; clean adjacent concrete, patch area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair expansion joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P			
	R	C	C	C
=====	=====	=====	=====	=====

EXTERIOR CLOSURE SYSTEM

EXTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GYPSUM BOARD CEILINGS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Moisture damage (including sugaring)	D/P/R R	X	X	X
Sagging	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X
M&R activities as required:				
Patch cracks, holes, & gouges	D/P R	S	S	N/S S
Repair moisture damage	D/P R	S	S	N/S S
Reattach & plaster	D/P R	S	S	N/S S
Clean surfaces	R	C	C	C
Prepare & paint surfaces	D/P R	C	C	C

Appendix F: Inspection and M&R Checklists for Interior Construction

One of the most important systems in defining the historic nature of the building is the interior construction system. This is because the layout of the building and its finishes could individually and collectively be the most important aspect in defining the historic nature of the building.

The interior construction system consists of the architectural and structural elements contained inside the building walls. Its components are: Walls, Floors, Ceilings, Doors, Windows, Stairs, and Decorations. This system does not include items that are not permanently attached to the building like, such as furniture, furnishings, and equipment.

With the exception of structural distresses that may cause a "domino" effect on other systems, the vast majority of interior items are directly related to habitability (quality of life). Clearly, work will be needed to bring the interiors of laid away buildings up to desired levels upon reactivation. The longer the layaway, the more repairs will be required to restore the historic nature of the building. Proper inspection and maintenance of the roof and exterior closure will minimize interior degradation, as will the installation of vents (discussed in Chapter 4). As a minimum, the interiors will have to be cleaned upon reactivation.

General Notes on Interior Paint

When corrosion is removed from a surface, that surface must receive touch-up paint.

Existing paint coatings may contain lead, which is a hazardous material. Special precautions must be taken when working with or around such coatings. See Volume I of Uzarski et al. [July 1991] for further information.

If pitting corrosion is present, remove corrosion, spot prime, and topcoat entire surface. If pitting corrosion continues, determine cause of corrosion and fix the condition before performing any further maintenance and repair.

Interior Metal

Perform surface preparation of general corrosion covering 3 percent or more and pitted corrosion covering 0.1 percent or more of the surface.

Interior Concrete

Perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

Interior Wood

Where noted perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

Interior Concrete Masonry Units

Perform surface preparation of deteriorated coatings covering 3 percent or more of the surface.

The interior construction system consists of the architectural elements contained within the building envelope. Its components are walls, floors and bases, ceilings, doors, windows, decorations, stairs, and fireplaces. This system does not include furniture, furnishings, or equipment.

Walls

Concrete Masonry Units

Structural Glazed Tile and Brick Masonry Units

Gypsum Wallboard

Gypsum Plaster

Ceramic Tile

Concrete Walls

Wood Paneling and Surfaces

Wood Veneer Faced Paneling and Plastic Laminate Paneling

Vinyl, Fabric, Wallpaper

Metal Cladding and Panels

Floors and Bases

Concrete Floors

Stone

Resilient Tile and Flooring

Masonry Units

Terrazzo Flooring

Wood Flooring

Ceramic Tile

Plastic/Synthetic

Carpet

Other

Bases: Vinyl, Metal, Wood, Structural Glazed Tile, and Ceramic Tile

Ceilings

Concrete Ceilings

Suspended Metal Ceilings

Gypsum Board Ceilings and Plaster Ceilings

Acoustical Ceilings

Exposed Ceiling Insulation

Doors

Hollow Metal Doors and Frames and Steel Doors and Frames

Metal Doors and Frames; Glass Doors and Frames

Wood Doors and Frames

Plastic

Glass in Doors

Louvers in Doors

Door Hardware

Caulking

Specialties

Metal Toilet Partitions

Toilet and Bath Accessories

Metal Wall Louvers

Metal Grilles and Screens

Identifying Devices: Bulletin Boards, Interior Signs, Directories, Etc.

Casework

Windows

Glass and Glazing

Steel Windows

Aluminum Windows

Vinyl Clad Wood Windows

Metal Clad Wood Windows

Window Hardware

Caulking

Interior Stairs

Concrete Stairs

Steel Guardrails, Handrails, and Stairs

Wood Guardrails, Handrails, and Stairs

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONCRETE MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, & gouges	D/P/R R	X	X	X
Surface marring	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Loose, broken, or missing units	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling, or missing mortar	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, holes, & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P R	S	S	S
-----	-----	-----	-----	-----
Resecure loose units; replace broken or missing units	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair joints	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

STRUCTURAL GLAZED TILE & BRICK MASONRY UNITS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Surface marring	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Loose, broken, or missing units	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling, or missing mortar	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P			
	R	S	S	S
-----	-----	-----	-----	-----
Resecure loose units; replace broken or missing units	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P			
	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces (including stains & discoloration)	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

TERRA COTTA UNIT MASONRY	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Surface marring	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Loose, broken, or missing units	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling, or missing mortar	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P			
	R	S	S	S
-----	-----	-----	-----	-----
Resecure loose units; replace broken or missing units	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P			
	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces (including stains & discoloration)	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GLASS BLOCK MASONRY	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Surface marring	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Loose, broken, or missing units	D/P/R R	X	X	X
Cracked, broken, loose, or crumbling, or missing mortar	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P			
	R	S	S	S
-----	-----	-----	-----	-----
Resecure loose units; replace broken or missing units	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Remove cracked, broken, loose, or crumbling mortar; repair joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P			
	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces (including stains & discoloration)	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
GYPSUM WALLBOARD	When to inspt	D<1yr	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, holes, & gouges	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface marring	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Fasteners, protrusions, & joint failure	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Staining & discoloration & mildew	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Moisture damage (including sugaring)	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface coat damage	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Locate source of moisture penetration	D/P/R R	X	X	X
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, holes, gouges, & joints	D/P R	S	S	S
-----	-----	-----	-----	-----
Resecure fasteners	D/P R	C	C	C
-----	-----	-----	-----	-----
Retape joints	D/P R	C	C	C
-----	-----	-----	-----	-----
Repair moisture damage	D/P R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
GYPSUM PLASTER	When to Inspt	D<1yr	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, holes, chips, & gouges	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface marring	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Staining & discoloration & mildew	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Moisture damage	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface coat damage	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Locate source of moisture penetration	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, holes, chips, & gouges	D/P R	S	S	S
-----	-----	-----	-----	-----
Repair moisture damage	D/P R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
PORTLAND CEMENT PLASTER	When to Inspt	D<1yr	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, holes, chips, & gouges	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface marring	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Staining & discoloration & mildew	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Moisture damage	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface coat damage	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Locate source of moisture penetration	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, holes, chips, & gouges	D/P R	S	S	S
-----	-----	-----	-----	-----
Repair moisture damage	D/P R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CERAMIC TILE	When to Inspt	D<1yr	D<1yr	D>1yr
Inspect for:				
Cracks, chips, & holes	D/P/R R	X	X	X
Surface marring	D/P/R R	X	X	X
Stains & discoloration & mildew	D/P/R R	X	X	X
Loose tiles	D/P/R R	X	X	X
Broken or missing tiles	D/P/R R	X	X	X
Loose or missing grout	D/P/R R	X	X	X
Moisture damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, & holes	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Grout-in loose tiles	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace broken or missing tiles	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Remove loose grout; regrout joints	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Repair moisture damage	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONCRETE WALLS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Surface marring	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Exposed reinforcing	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Patch chips & gouges	D/P R	S	S	S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Clean rebar & adjacent concrete; coat rebar, patch area	D/P R	C/S	C/S	C/S
-----	-----	-----	-----	-----
Replace rebar; clean adjacent concrete, patch area	D/P R	C/S	C/S	C/N C/S
-----	-----	-----	-----	-----
Repair expansion joints	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

WOOD PANELING & WOOD SURFACES	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, & gouges	D/P/R R	X	X	X
Surface marring & abrasion	D/P/R R	X	X	X
Warp; loose sections	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, holes, & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P R	S	S	S
-----	-----	-----	-----	-----
Refinish damaged surfaces	D/P R	C	C	C
-----	-----	-----	-----	-----
Secure loose panels	D/P R	C	C	C
-----	-----	-----	-----	-----
Replace panels	D/P R	S	S	S
-----	-----	-----	-----	-----
Replace rotted panels	D/P R	S	S	S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

WOOD VENEER FACED PANELING & PLASTIC LAMINATE PANELING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, & gouges	D/P/R R	X	X	X
Surface marring & abrasion	D/P/R R	X	X	X
Warp; loose sections	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R	X	X	X
Rot	D/P/R R	X	X	X
Delamination	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, holes, & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P R	S	S	S
-----	-----	-----	-----	-----
Refinish damaged surfaces	D/P R	C	C	C
-----	-----	-----	-----	-----
Secure loose panels	D/P R	C	C	C
-----	-----	-----	-----	-----
Replace panels	D/P R	S	S	S
-----	-----	-----	-----	-----
Replace rotted panels	D/P R	S	S	S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration & mildew	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

=====	=====	=====	=====	=====
VINYL, FABRIC, WALLPAPER	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Holes, gouges, splits, tears, peeling, & blistering	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface abrasion and marring	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Staining & discoloration	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Insect infestation	D/P/R X		X	X
-----	-----	-----	-----	-----
Moisture damage	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Locate source of moisture penetration	D/P/R R	X	X	X
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch holes, gouges, splits, & tears	D/P R	S	S	S
-----	-----	-----	-----	-----
Resecure peeling or blistering paper	D/P R	C	C	C
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P R	S	S	S
-----	-----	-----	-----	-----
Replace sections	D/P R	S	S	S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P R	C	C	C
-----	-----	-----	-----	-----
Repair moisture damage	D/P R	S	S	S
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

METAL CLADDING & METAL PANELS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
Surface marring	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Deformed sections	D/P/R R	X	X	X
Loose, broken, or missing sections or fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR WALLS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch small cracks & holes;	D/P			N/S
replace sections with large	R	S	S	S
cracks & holes				
-----	-----	-----	-----	-----
Replace sections with	D/P			N/S
dents or gouges	R	S	S	S
-----	-----	-----	-----	-----
Remove corrosion	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Replace deformed sections	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Secure loose sections &	D/P			N/S
fasteners	R	S	S	S
-----	-----	-----	-----	-----
Replace broken or missing	D/P			N/S
sections & fasteners	R	S	S	S
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P			
	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

HOLLOW METAL DOORS & FRAMES & STEEL DOORS & FRAMES	When to Insp	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
Surface abrasion & marring	D/P/R R	X	X	X
Stains & discoloration	D/P/R R	X	X	X
Malfunction & misalignment	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
M&R activities as required:				
Patch cracks, holes, dents, & gouges	R	C	C	C
Adjust alignment	D/P	C	C	C
Repair or replace doors & frames	R	C	C	C
Remove corrosion	D/P R	C	C	C C
Clean surfaces	R	C	C	C
Prepare & paint surfaces	D/P	C	C	C

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
	When	D<1yr	D<1yr	D>1yr
METAL & GLASS DRS & FRAMES	to			
=====	Inspt	=====	=====	=====
Inspect for:				
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
Surface abrasion & marring	D/P/R R	X	X	X
Stains & discoloration	D/P/R R	X	X	X
Malfunction & misalignment	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Cracked, broken, or missing glass	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, holes, dents, & gouges	R	C	C	C
-----	-----	-----	-----	-----
Repair or replace doors & frames		C	C	C
-----	-----	-----	-----	-----
Remove corrosion	D/P			C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	R	C	C	C
-----	-----	-----	-----	-----
Replace cracked, broken, or missing glass	D/P			C
-----	-----	-----	-----	-----
If cracked, broken, or missing, board up opening	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WOOD DOORS & FRAMES	When to Inspt	D<1yr	D<1yr	D>1yr
Inspect for:				
Cracks, holes, & gouges	D/P/R R	X	X	X
Surface abrasion & marring	D/P/R R	X	X	X
Malfunction & misalignment	D/P/R R	X	X	X
Warp	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Insect infestation	D/P/R	X	X	X
Surface coat damage	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, holes, & gouges	R	C	C	C
-----	-----	-----	-----	-----
Repair damaged surfaces	R	C	C	C
-----	-----	-----	-----	-----
Repair or replace doors & frames	R	C	C	C
-----	-----	-----	-----	-----
Adjust alignment	R	C	C	C
-----	-----	-----	-----	-----
Replace rotted doors	R	C	C	C
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P R	C C	C C	C C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & stain or paint surfaces	R	C	C	C C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GLASS IN DOORS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracked, broken, or missing glass	D/P/R R	X	X	X
Cracked, broken, or missing seals or gaskets	D/P/R R	X	X	X
M&R activities as required:				
Replace cracked, broken, or missing glass	D/P R	S	S	N/S S
Replace cracked, broken, or missing seals or gaskets	D/P R	S	S	N/S S

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
LOUVERS IN DOORS	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Malfunction & misalignment	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Broken or missing sections	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Corrosion	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, holes, dents, & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Repair damaged surfaces	D/P R	S	S	S
-----	-----	-----	-----	-----
Repair or replace louvers or sections of louvers	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Remove corrosion	D/P R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
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 R = Reactivation N = Different material
 C = Compatible method

DOOR HARDWARE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Functioning hinges	D/P/R R	X	X	X
Broken or missing components	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Malfunction & misalignment	D/P/R R	X	X	X
M&R activities as required:				
Oil hinges	D/P R	C	C	C C
Repair or replace components	D/P R	S	S	N/S S
Remove corrosion	D/P R	C	C	C C

INTERIOR CONSTRUCTION SYSTEM

INTERIOR DOORS

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose caulk	D/P/R R	X	X	X
Broken or missing caulk	D/P/R R	X	X	X
Eroded caulk	D/P/R R	X	X	X
M&R activities as required:				
Remove loose, broken, & eroded caulk	D/P R	C	C	C C
Clean surfaces & recaulk	D/P R	S	S	N/S S

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONCRETE FLOORS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Surface abrasion, wear, & gouges	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Stains & discoloration	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X
M&R activities as required:				
Patch cracks & holes	D/P R	S	S	N/S S
Repair gouges; resurface or patch eroded surfaces	D/P R	S	S	N/S S
Remove spalling & scaling, patch area	D/P R	S	S	N/S S
Clean surfaces	R	C	C	C
Prepare & paint surfaces (when previously painted)	D/P R	C	C	C

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

RESILIENT TILE & RESILIENT FLOORING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, & holes	D/P/R R	X	X	X
Surface abrasion, wear, & gouges	D/P/R R	X	X	X
Stains & discoloration	D/P/R R	X	X	X
Loose or missing tiles	D/P/R R	X	X	X
Open joints	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X
M&R activities as required:				
Replace damaged tiles	D/P R	S	S	N/S S
Replace missing tiles	D/P R	S	S	N/S S
Readhere loose tiles	D/P R	C	C	C C
Clean surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

TERRAZZO FLOORING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, & holes	D/P/R R	X	X	X
Surface abrasion, wear, & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Open joints at divider strips	D/P/R R	X	X	X
Broken or missing divider strips	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X
M&R activities as required:				
Repair or replace damaged areas	D/P R	S	S	N/S S
Replace broken or missing divider strips	D/P R	S	S	N/S S
Clean surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WOOD FLOORING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Sags & warp	D/P/R R	X	X	X
Surface abrasion, wear, & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Loose or open joints	D/P/R R	X	X	X
Loose, broken, or missing sections	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Fungal growth	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair or replace damaged areas	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace broken, missing, or rotted sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Readhere loose sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Refinish surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CERAMIC TILE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, & holes	D/P/R R	X	X	X
Surface abrasion, wear, & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Loose tile	D/P/R R	X	X	X
Broken or missing tile	D/P/R R	X	X	X
Loose, broken or missing grout	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X
M&R activities as required:				
Repair or replace damaged areas	D/P R	S	S	N/S S
RegROUT loose tile	D/P R	S	S	N/S S
Replace broken or missing tile	D/P R	S	S	N/S S
Replace loose, broken or missing grout	D/P R	S	S	N/S S
Clean surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CARPET	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Rips, tears, holes, wear, & raveling	D/P/R R	X	X	X
Wrinkles	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Dampness; rot	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R R	X	X	X
M&R activities as required:				
Repair or replace damaged sections	D/P R	S	S	S
Restretch	D/P R	C	C	C
Remove damp, rotten sections & replace	D/P R	S	S	N/S S
Eradicate insect infestation	D/P R	C	C	C
Clean surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

BASES: VINYL, METAL, WOOD, STRUCTURAL GLAZED TILE, & CERAMIC TILE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Sags & warp	D/P/R R	X	X	X
Chips & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Loose, broken, or missing sections	D/P/R R	X	X	X
Loose, broken, or missing grout	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X

INTERIOR CONSTRUCTION SYSTEM

INTERIOR FLOORS & BASES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair or replace damaged areas	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace rotted sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Readhere loose sections	D/P R	C	C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace loose, broken, or missing grout	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P/R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

CONCRETE CEILINGS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Staining & discoloration & mildew	D/P/R R	X	X	X
Exposed reinforcing	D/P/R R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair spalled or scaled area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean rebar & adjacent concrete; coat rebar, patch area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Replace rebar; clean adjacent concrete, patch area	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair expansion joints	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P			
	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
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 R = Reactivation N = Different material
 C = Compatible method

SUSPENDED METAL CEILINGS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Holes, dents, & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Warp; loose sections	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X
M&R activities as required:				
Replace sections	D/P R	S	S	N/S S
Remove corrosion	D/P R	C	C C	C C
Clean surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GYPSUM BOARD CEILINGS & PLASTER CEILINGS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Moisture damage (including sugaring)	D/P/R R	X	X	X
Sagging	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X
M&R activities as required:				
Patch cracks, holes, & gouges	D/P R	S	S	N/S S
Repair moisture damage	D/P R	S	S	N/S S
Reattach & plaster	D/P R	S	S	N/S S
Clean surfaces	R	C	C	C
Prepare & paint surfaces	D/P R	C	C	C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
ACOUSTICAL CEILINGS	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
Cracks, holes, & gouges	D/P/R R	X	X	X
Staining & discoloration	D/P/R R	X	X	X
Warp; loose sections	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Misaligned trim	D/P/R R	X	X	X
Corroded or damaged trim	D/P/R R	X	X	X
Moisture damage	D/P/R	X	X	X
Locate source of moisture penetration	D/P/R	X	X	X
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Replace damaged sections	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Adjust tiles & trim	D/P			
	R	S	S	S
-----	-----	-----	-----	-----
Remove corrosion from trim	D/P		N/S	N/S
& paint	R	S	S	S
-----	-----	-----	-----	-----
Clean surfaces of trim	D/P			
	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR CEILINGS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

=====	=====	=====	=====	=====
	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
EXPOSED CEILING INSULATION				
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Wet insulation	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Loose or missing insulation	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Locate source of moisture penetration	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Remove & replace wet insulation	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Resecure loose insulation	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace missing insulation	D/P R	S	S	N/S S
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR SPECIALTIES

NOTE: D = Deactivation X = Item to be inspected d = days
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 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
METAL TOILET PARTITIONS	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Corrosion	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Loose, broken, or missing supports or hardware	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks, chips, holes, dents, & gouges	D/P R	S	S	S
-----	-----	-----	-----	-----
Repair or replace sections	D/P R	S	S	S
-----	-----	-----	-----	-----
Remove corrosion	D/P R	C	C	C
-----	-----	-----	-----	-----
Resecure or replace supports and hardware	D/P R	S	S	S
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR SPECIALTIES

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

=====	=====	=====	=====	=====
TOILET & BATH ACCESSORIES	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, chips, holes, dents, gouges, & deformation	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Corrosion	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Loose fit	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Loose, broken, or missing accessories	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Malfunction	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair or replace accessories	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Remove corrosion	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Secure fit	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR SPECIALTIES

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

=====	=====	=====	=====	=====
METAL WALL LOUVERS	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X
M&R activities as required:				
Repair cracks, chips, holes, dents, & gouges	D/P R	S	S	N/S S
Repair or replace sections	D/P R	S	S	N/S S
Remove corrosion	D/P R	C	C	C C
Resecure loose fasteners	D/P R	C	C	C C
Replace broken or missing sections & fasteners	D/P R	S	S	N/S S
Clean surfaces	R	C	C	C
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR SPECIALTIES

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

=====	=====	=====	=====	=====
METAL GRILLES & SCREENS	When to Inspt	D<1yr	D<1yr	D>1yr
=====	=====	=====	=====	=====
Inspect for:				
=====	=====	=====	=====	=====
Cracks, holes, dents, & gouges	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Corrosion	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
-----	-----	-----	-----	-----
Surface coat damage	D/P/R R	X	X	X
=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks, holes, dents, & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Remove corrosion	D/P R	C	C	C C
-----	-----	-----	-----	-----
Resecure loose fasteners	D/P R	C	C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections & fasteners	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR SPECILATIES

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

IDENTIFYING DEVICES: BULLETIN BOARDS, INTERIOR SIGNS, DIRECTORIES, ETC.	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, dents, & gouges	R	X	X	X
Corrosion	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	R	X	X	X
Surface coat damage	R	X	X	X
M&R activities as required:				
Repair cracks, chips, holes, dents, & gouges	R	S	S	S
Remove corrosion	D/P R	C	C	C
Resecure loose fasteners	R	C	C	C
Replace broken or missing sections & fasteners	R	S	S	S
Clean surfaces	R	C	C	C
Prepare & paint surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR SPECIALTIES

NOTE: D = Deactivation X = Item to be inspected d = days
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CASEWORK	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, holes, & deformation	D/P/R R	X	X	X
Dents, gouges, & chips	D/P/R R	X	X	X
Sags & warp	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Loose, broken, or missing specialties, supports, or hardware	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR SPECIALTIES

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks, chips, holes, dents, gouges, & deformation	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Remove corrosion	D/P R	C	C	C C
-----	-----	-----	-----	-----
Replace rotted sections	D/P R	S	S	S
-----	-----	-----	-----	-----
Resecure loose specialties, supports, & hardware	D/P R	C	C	C
-----	-----	-----	-----	-----
Repair or replace broken or missing specialties, supports, & hardware	D/P R	S	S	S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P/R R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare & refinish or paint surfaces	D/P R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

GLASS & GLAZING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Broken or missing glass	D/P/R R	X	X	X
Broken or missing glazing	D/P/R R	X	X	X
Double glazing seal failure	R	X	X	X
M&R activities as required:				
Replace broken or missing glass and glazing, & sealed units	D/P R	S	N/S S	N/S S
If glass or glazing broken or missing, board up opening	D/P R	C C	C C	C C
Clean surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
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 R = Reactivation N = Different material
 C = Compatible method

STEEL WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Warping & racking	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Stains & discoloration	R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

M&R activities as required:				
Repair cracks & holes	D/P R	S	S	N/S S
Repair damaged surfaces	R	C	C	C
Remove corrosion	D/P R	C	C C	C C
Secure loose sections & loose or missing fasteners	D/P R	C	C C	C C
Replace broken or missing sections	D/P R	S	N/S S	N/S S
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C	C C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

ALUMINUM WINDOWS	When to Inspt	D<1yr	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks & holes	D/P			N/S
	R	S	S	S
-----	-----	-----	-----	-----
Repair damaged surfaces	R	C	C	C
-----	-----	-----	-----	-----
Remove corrosion	D/P			C
	R	C	C	C
-----	-----	-----	-----	-----
Secure loose sections & loose or missing fasteners	D/P		C	C
	R	C	C	C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P		N/S	N/S
	R	S	S	S
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare surfaces & paint (when previously painted)	D/P/R			C
	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
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 R = Reactivation N = Different material
 C = Compatible method

VINYL CLAD WOOD WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, & holes	D/P/R R	X	X	X
Open joints	D/P/R R	X	X	X
Surface damage; detachment	D/P/R R	X	X	X
Decayed wood core	D/P/R R	X	X	X
Staining & discoloration	D/P/R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, & holes	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace decayed sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Secure loose sections & loose or missing fasteners	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Seal open joints	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

METAL CLAD WOOD WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, chips, holes, dents, & gouges	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Open joints	D/P/R R	X	X	X
Decayed wood core	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Surface damage; detachment	D	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Patch cracks, chips, holes, dents, & gouges	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace decayed sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Secure loose sections & loose or missing fasteners	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Seal open joints	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C C	C C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C C	C C
-----	-----	-----	-----	-----
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C C	C C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WOOD WINDOWS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Warp	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Rot	D/P/R R	X	X	X
Insect infestation	D/P/R R	X	X	X
Fungal growth	D/P/R R	X	X	X
Loose sections & loose or missing fasteners	D/P/R R	X	X	X
Broken or missing sections	D/P/R R	X	X	X
Open joints	D/P/R R	X	X	X
Surface coat damage	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks, splits, & holes	D/P R	S	S	N/S S
Refinish surfaces	R	S	S	S
Remove rot & replace sections	D/P R	S	N/S S	N/S S
Secure loose sections & loose or missing fasteners	D/P R	C	C	C
Replace broken or missing sections	D/P R	S	N/S S	N/S S
Tighten open joints	D/P R	C	C	C C
Eradicate insect infestation	D/P R	C	C	C C
Clean off fungus growth	D/P R	C	C	C C
Clean off surface stains & discoloration	R	C	C	C
Clean surfaces	R	C	C	C
Prepare surfaces & paint (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WINDOW HARDWARE	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Broken or missing components (stays, handles, balances, etc.)	D/P/R R	X	X	X
Window locks	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Malfunction or misalignment	R	X	X	X
Operation of balances	R	X	X	X
M&R activities as required:				
Repair or replace broken or missing components	D/P R	S	S	N/S S
Repair or replace window locks	D/P R	S	S	N/S S
Restore to proper working order, eg., unsticking a wood window	R	C	C	C
Remove corrosion	D/P R	C	C	C C
Refinish hardware	R	C	C	C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR WINDOWS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CAULKING	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Loose caulk	R	X	X	X
Missing caulk	D/P/R R	X	X	X
Eroded caulk	D/P/R	X	X	X
M&R activities as required:				
Remove loose, eroded, or damaged caulk, clean surfaces, recaulk	D/P/R R	C	C	C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR STAIRS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONCRETE STAIRS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks & holes	D/P/R R	X	X	X
Spalling & scaling	D/P/R R	X	X	X
Movement	D/P/R R	X	X	X
Tripping & slipping hazards	D/P/R	X	X	X
Exposed reinforcing	D/P/R	X	X	X
Damaged expansion joints	D/P/R R	X	X	X
Clogged weep holes	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR STAIRS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

M&R activities as required:				
Repair cracks, chips, & holes	D/P R	S	S	N/S S
Replace damaged sections	D/P R	S	S	N/S S
Replace sections that cause tripping hazards; clean off slipping hazards	D/P/R	S	S	S
Clean rebar & adjacent concrete; coat rebar, patch area	D/P R	C	C C	C C
Replace rebar; clean adjacent concrete, patch area	D/P R	S	N/S S	N/S S
Repair or replace damaged expansion joints	D/P R	C	C	C C
Consult with engineer for movement correction procedure	D/P R	C	C C	C C
Rod out clogged weep holes	D/P R	C	C	C C
Clean surfaces	R	C	C	C

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR STAIRS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

STEEL GUARDRAILS, HANDRAILS, & STAIRS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, holes, dents, & deformation	D/P/R R	X	X	X
Corrosion	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R R	X	X	X
Surface coat damage	D/P R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR STAIRS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Repair cracks, holes, dents, & deformation	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Remove corrosion	D/P R	C	C	C C
-----	-----	-----	-----	-----
Secure loose sections & fasteners	D/P R	C	C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Clean off surfaces stains & discoloration	D/P R	C	C	C C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare surface & paint (when previously painted)	D/P R	C	C	C C
=====	=====	=====	=====	=====

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR STAIRS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

WOOD GUARDRAILS, HANDRAILS, & STAIRS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Cracks, splits, & holes	D/P/R R	X	X	X
Gouges	D/P/R R	X	X	X
Rot	D/P/R R	X	X	X
Staining & discoloration	R	X	X	X
Insect infestation	D/P/R R	X	X	X
Fungal growth	D/P/R	X	X	X
Warped sections	D/P/R R	X	X	X
Loose, broken, or missing sections & fasteners	D/P/R	X	X	X
Surface coat damage	D/P/R R	X	X	X

INTERIOR CONSTRUCTION SYSTEMS

INTERIOR STAIRS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
M&R activities as required:				
=====	=====	=====	=====	=====
Seal cracks, splits, & holes	D/P R	C	C	C C
-----	-----	-----	-----	-----
Repair or replace gouged areas	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Replace rotted sections	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Replace warped sections	D/P R	S	S	N/S S
-----	-----	-----	-----	-----
Secure loose sections & fasteners	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Replace broken or missing sections & fasteners	D/P R	S	N/S S	N/S S
-----	-----	-----	-----	-----
Eradicate insect infestation	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Clean off fungus growth	D/P R	C	C C	C C
-----	-----	-----	-----	-----
Clean off surface stains & discoloration	R	C	C	C
-----	-----	-----	-----	-----
Clean surfaces	R	C	C	C
-----	-----	-----	-----	-----
Prepare surface & paint (when previously painted)	D/P/R R	C	C	C C
=====	=====	=====	=====	=====

Appendix G: Inspection and M&R Checklists for Plumbing

General Notes

The plumbing system is considered a hidden system because a visual inspection will probably not discover many distresses. The components of the plumbing system are supply piping, waste piping & traps, fixtures, equipment, septic units, and fire protection. Specifically, plumbing refers to the pipes that convey potable water from the service drop throughout the building, the fixtures at which the water is used, the building water heater or hot water storage tank, and pipes that convey sewage out of the building. Fixtures in typical buildings include showers, lavatories, bathtubs, water closets, urinals, drinking fountains, and service sinks. Generally, not many components of the plumbing system contribute to the historic nature of the building.

This checklist essentially covers shutdown and startup procedures. Very little inspection is needed since the system will be shut down and drained. However, it is important that the steps be followed in the sequence listed.

The domestic water supply to the building heating system should be shut off. Make sure that the valve is opened when the building is reactivated.

Failure to inspect and replenish propylene glycol (so traps remain sealed) may result in seepage of hydrogen sulfide (sewer gas) into the building. This gas should not affect the plumbing system, but it is hazardous to people and may accelerate deterioration of paint and metallic components.

It is acceptable to use alcohol-based windshield washer fluid in place of propylene glycol to seal the traps.

If the plumbing system is deactivated for 6 months or longer, the valve packing and washers in the components that contain them should be replaced at the time of reactivation, because the material will age and lose its resiliency in a dry system.

The problems that needed to be addressed in developing these procedures were internal corrosion or deterioration of the system, freezing of the lines, and water damage to the building. The only alternative for deactivation that will eliminate all of these problems is the complete draining and drying of the system.

Components and Subcomponent List for the Plumbing System

Equipment

Water heater

Valves

Fixtures

Drinking fountains

Kitchen sinks

Service sinks

Urinals

Showers

Laundry sinks

Water Closet

Supply Piping

Waste Piping and Traps

PLUMBING SYSTEM

GENERAL

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GENERAL	When to Inspt	D<30d	D<1yr	D>1yr
Inspect for:				
Drains and traps to in- sure that there is enough propylene glycol remain- ing to seal them.	P		X	X
Breakage, vandalism, stolen property (fixtures & equip.)	P/R		X	X
M & R activities:				
Flush all urinals and water closets once.	D	X	X	X
Close valves inside the building to the domestic water side of the system.	D	X	X	X
Shut off energy to domestic hot water heaters/ tanks.	D	X	X	X
Drain all water heaters/ storage tanks.	D	X	X	X
Drain the closed/shut off domestic hot and cold water lines.	D	X	X	X
Drain lines to and from each urinal and water closet.	D	X	X	X

PLUMBING SYSTEM

GENERAL

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GENERAL	When to Inspt	D<30d	D<1yr	D>1yr
M & R activities:				
Dismantle valve/stop (flushometer) for each urinal or water closet and store components in a non-biodegradable bag attached to unit.	D		X	X
Drain lines to and from each shower.	D	X	X	X
Dismantle shower valves and store components in a non-biodegradable bag attached to unit.	D		X	X
Drain lines to and from each lavatory.	D	X	X	X
Drain lines to and from each service sink.	D	X	X	X
Drain lines to and from each laundry tray.	D	X	X	X
Drain lines to and from each automatic clothes washer and drain associated hoses and pump.	D	X	X	X
Drain lines to and from each drinking fountain and associated tank.	D	X	X	X
Remove any remaining water from lines by blowing compressed air through the system.	D	X	X	X

PLUMBING SYSTEM

GENERAL

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GENERAL	When to Inspt	D<30d	D<1yr	D>1yr
M & R activities:				
Add propylene glycol (antifreeze) to all floor drains and traps.	D	X	X	X
Repair broken/missing pipes/fixtures if necessary for safety or other critical reason. Otherwise, just note it.	P		X	X
Repair all broken/missing fixtures/piping.	R	X	X	X
Restore valve/stop on each water closet and urinal to working condition by: Reassembling valve/stop using appropriate flush and handle kits	R		X	X
Restore each shower valve to working condition according by reassembling shower valve, replacing washers and packing	R		X	X
Replace washers and packing on faucets for each lavatory.	R		X	X
Replace washers and packing on faucets for each service sink.	R		X	X
Replace washers and packing on faucets for each laundry tray.	R		X	X

PLUMBING SYSTEM

GENERAL

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

GENERAL	When to Inspt	D<30d	D<1yr	D>1yr
M & R activities:				
Replace hoses, washers, and packing for each automatic clothes washer. Replace unit if necessary	R		X	X
Replace pressure regu- lator, washers, and packing for each drinking fountain. Replace unit if necessary.	R		X	X
Slowly open valve(s) inside each building to domestic water side of system.	R	X	X	X
Check for leaks as taps/ units are individually activated. Repair leaks.	R	X	X	X
Fill lines, tanks, and heater. Check for proper operation and pressure.	R	X	X	X
Restore energy to hot water heaters/ tanks.	R	X	X	X
Flush all floor drains and traps to remove propylene glycol.	R	X	X	X
Check drain lines for leaks after flushing water closets and urinals or running water in sinks or other units. Repair leaks.	R	X	X	X

Appendix H: Inspection and M&R Checklists for Building Heating Systems

General Notes on Heating Systems

The heating system is considered a hidden system because a visual inspection will probably not discover many distresses. Specifically, the heating system refers to the pipes and ducts that carry heat from the boiler or furnace to a heat transfer item such as a register or radiator; the register or radiator at which the heat is transferred to the air; the pipes and ducts that carry cold air from the register back to the heating unit.

The visible features of the heating system can contribute to the historic nature of the building. These features include radiators, grilles, and heat registers. For the most part, the heating system of the building is hidden from view and has probably been altered many times to bring it up to current codes. Therefore, the mechanical components of the heating system generally do not contribute to the historical nature of the building.

For the purpose of this report, the term *building heating system* refers to all heating equipment within a building that uses steam generated at a central boiler plant. It does not include the steam distribution system outside the building, but does include such components as pressure-reducing stations, steam-to-hot-water converters, flash and expansion tanks, condensate and hot water circulation pumps, condensate receivers, etc.

All heat-transfer devices such as registers, grilles, and radiators should be closed. Registers should be blocked up, valves to the steam or hot water heaters closed, power to the furnace, heater, or boiler shut off, supply and return lines completely dried them out, and all gas lines to the furnace, heater, or boiler shut off. Some systems will include an underground storage tank. For more information on this, see Volume I of Uzarski et al. [July 1991].

Deactivation procedures also involve the draining and drying of building heating system components where the deactivation period exceeds 30 days. For system

components where wet storage is used, corrosion inhibitors should be added to the fresh water fill. In addition, the system should always be filled to capacity. Under such conditions, periodic inspection and maintenance procedures are minimal, involving essentially only walk-through inspection for signs of external sweating or corrosion of various components (and the appropriate corrective action where needed).

Component and Subcomponent List for Heating Systems

Controls

Equipment

- Condensate Pump and Motor
- Condensate Receiver
- Expansion Tank
- Flash Tank
- Hot Water Circulation Pump and Motor
- Pressure-Reducing Station
- Steam Supply Line Traps and Strainers

Heating Equipment

- Hot Water Generator (Steam Side)

Heat Transfer Equipment

- Radiator
- Steam-to-Hot-Water Converter

Piping Network

- Hot Water Heating Supply and Return Piping in Buildings
- Steam Supply and Return Piping in Buildings

HEATING SYSTEMS

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONDENSATE RECEIVER	When to Inspt	D<30d	D<1yr	D>1yr
Inspect:				
Receiver for leaks and proper operation	D/P R	X	X X	X X
Receiver for evidence of sweating and corrosion	P/R		X	X X
M & R activities:				
Repair or replace receiver where necessary	D/P R	X	X X	X X
Drain receiver	D		X	X
Clean out deposits, mud, scale, etc. Wire brush where necessary	D		X	X
Paint interior surfaces of receiver	D		X	X
Clean corrosion from receiver where necessary	R		X	X
Provide portable heating to control sweating and corrosion where necessary	P		X	X X
Reconnect piping	R		X	X

HEATING SYSTEMS

HEAT TRANSFER EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

	When to Inspt	D<30d	D<1yr	D>1yr
STEAM TO HOT WATER CONVERTER				
Inspect:				
Converter for leaks and proper operation	D R	X	X X	X X
Converter for missing or deteriorated insulation	D R	X	X X	X X
Converter for evidence of sweating and corrosion	P R		X X	X X
M & R activities:				
Repair or replace con- verter where necessary	D R	X	X X	X X
Replace missing or de- teriorated insulation	D R	X	X X	X X
Flush converter steam coil with fresh water	D		X	X
Drain converter	D		X	X
Dry converter steam coil using compressed air	D		X	X
Dry converter hot water side using compressed air	D		X	X
Provide portable heating to control sweating and corrosion where neces- sary	P		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

CONDENSATE PUMP AND MOTOR	When to Inspt	D<30d	D<1yr	D>1yr
Inspect:				
Pump for leaks	D R	X	X X	X X
Pump for proper operation	D R	X	X X	X X
Pump and pump motor for corrosion	P		X	X X
M & R activities:				
Repair or replace pump where necessary	D R	X	X X	X X
Flush pump with fresh water and drain	D		X	X
Coat interior surfaces with engine preservative oil MIL-L-21260, grade 2, by spraying or fogging while slowly actuating the pump	D		X	X
Cover shaft with compound preservative, Specifica- tion MIL-C-11796B, class 2	D		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

CONDENSATE PUMP AND MOTOR (continued)	When to Inspt	D<30d	D<1yr	D>1yr
Seal all pump openings with pressure sensitive tape, MIL-T-4053B	D		X	X
Clean and paint pump and motor where necessary	D/P		X	X
Lubricate pump and pump motor	R		X	X
Remove pressure sensitive tape from pump openings	R		X	X
Remove all internal and external protective coat- ings	R		X	X
Hand test pump for ease of rotation	R		X	X
Perform low voltage ohm- meter test on pump motor for proper insulation	R		X	X
Dry in a suitable oven any pump motor having low insulation resistance	R		X	X
Test run pump motor under load for 4 or more hours	R			X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
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 C = Compatible method

EXPANSION TANK	When to Inspt	D<30d	D<1yr	D>1yr
Inspect:				
Tank for leaks	D R	X	X X	X X
Tank for evidence of sweating and corrosion	P/R		X	X
M & R activities:				
Repair tank leaks or replace tank where neces- sary	D R	X	X X	X X
Flush tank with fresh water and drain	D		X	X
Clean out deposits, mud, scale, etc. Wire brush where necessary	D		X	X
Spray or fog interior surfaces of tank with preservative (MIL-C-16173 C)	D		X	X
Clean corrosion from tank where necessary	R		X	X
Provide portable heat to control sweating and cor- rosion where necessary	P		X	X
Reconnect piping	R		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

FLASH TANK	When to Inspt	D<30d	D<1yr	D>1yr
Inspect:				
Tank for leaks	D R	X	X X	X X
Tank for evidence of sweating and corrosion	P/R		X	X
M & R activities:				
Repair tank leaks or replace tank where neces- sary	D R	X	X X	X X
Flush tank with fresh water and drain	D		X	X
Clean out deposits, mud, scale, etc. Wire brush where necessary	D		X	X
Spray or fog interior surfaces of tank with preservative (MIL-C-16173 C)	D		X	X
Clean corrosion from tank where necessary	R		X	X
Provide portable heat to control sweating and cor- rosion where necessary	P		X	X
Reconnect piping	R		X	X

HEATING SYSTEM

HEATING EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

	When to Inspt	D<30d	D<1yr	D>1yr
HOT WATER GENERATOR (STEAM SIDE)				
Inspect:				
Heater coil for leaks	R	X	X	X
M & R activities:				
Flush heater coil with fresh water and drain	D		X	X
Dry heater coil with com- pressed air	D		X	X
Repair heater coil leaks where necessary	R	X	X	X

HEATING SYSTEM

PIPING NETWORK

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

HOT WATER HEATING SUPPLY AND RETURN PIPING IN BUILDINGS	When to Inspt	D<30d	D<1yr	D>1yr
Inspect:				
Supply and return lines for leaks	D R	X	X X	X X
Supply line for missing or deteriorated insula- tion	D R	X	X X	X X
M & R activities:				
Repair supply and return line leaks	D R	X	X X	X X
Replace missing or dete- riorated supply line in- sulation	D R	X	X X	X X
Flush supply and return lines with fresh water	D/R		X	X
Drain supply and return lines	D		X	X
Dry supply and return lines with compressed air	D		X	X
Cover all supply and re- turn line openings with caps, blank flanges, or wooden plugs	D		X	X

HEATING SYSTEM

HEATING EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

HOT WATER HEATING SUPPLY AND RETURN PIPING IN BUILDINGS (continued)	When to Inspt	D<30d	D<1yr	D>1yr
Coat all pipe threads and finished surfaces left exposed by disconnecting for draining with a film of graphite and oil	D		X	X
Remove all preservatives from flanges, nipples, and threaded openings	R		X	X
Remove all blanks in sup- ply and return lines and reconnect piping	R		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

	When to Inspt	D<30d	D<1yr	D>1yr
HOT WATER CIRCULATION PUMP AND MOTOR				
Inspect:				
Pump for leaks	D R	X	X X	X X
Pump for proper operation	D R	X	X X	X X
Pump and pump motor for corrosion	R		X	X
M & R activities:				
Repair or replace pump where necessary	D R	X	X X	X X
Flush pump with fresh water and drain	D		X	X
Coat interior surfaces with engine preservative oil MIL-L-21260, grade 2, by spraying or fogging while slowly actuating the pump	D		X	X
Cover shaft with compound preservative, Specifica- tion MIL-C-11796B, class 2	D		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

HOT WATER CIRCULATION PUMP AND MOTOR (con- tinued)	When to Inspt	D<30d	D<1yr	D>1yr
Seal all pump openings with pressure sensitive tape, MIL-T-4053B	D		X	X
Clean and paint pump and motor where necessary	D/P		X	X X
Lubricate pump and pump motor	P R		X	X
Remove pressure sensitive tape from pump openings	R		X	X
Remove all internal and external protective coat- ings	R		X	X
Hand test pump for ease of rotation	R			X
Perform low voltage ohm- meter test on pump motor for proper insulation	R		X	X
Dry in a suitable oven any pump motor having low insulation resistance	R		X	X
Test run pump motor under load for 4 or more hours	R			X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

	When to Inspt	D<30d	D<1yr	D>1yr
PRESSURE-REDUCING STATION				
Inspect:				
Pressure-reducing station for leaks	D R	X	X X	X X
Pressure-reducing station for proper operation	D R	X	X X	X X
M & R activities:				
Repair pressure-reducing station leaks	D R	X	X X	X X
Repair, replace, or adjust pressure-reducing valve where necessary	D R	X	X X	X X
Open and drain equalizing pipe between diaphragm chamber and low side of system	D		X	X
Open all valves and clean internally	D		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====	=====	=====	=====	=====
PRESSURE-REDUCING STATION (continued)	When to Inspt	D<30d	D<1yr	D>1yr
=====	=====	=====	=====	=====
Loosen lower section of pressure-reducing valve to provide drainage	D		X	X
-----	-----	-----	-----	-----
Coat all working parts and machined surfaces with a light oil coating	D		X	X
-----	-----	-----	-----	-----
Open vents on the low pressure side of the pressure-reducing valve	D		X	X
-----	-----	-----	-----	-----
Close vents on the low pressure side of the pressure-reducing valve	R		X	X
-----	-----	-----	-----	-----
Reconnect all piping	R		X	X
=====	=====	=====	=====	=====

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

	When to Inspt	D<30d	D<1yr	D>1yr
RADIATOR				
Inspect:				
Radiator for leaks	D R	X	X X	X X
Radiator controls for proper operation	D R	X	X X	X X
M & R activities:				
Repair or replace radia- tor where necessary	D R	X	X X	X X
Repair radiator controls where necessary	D R	X	X X	X X
Drain radiator	D		X	X
Dry radiator tubes using compressed air	D		X	X
Clean radiator fins	R	X	X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
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 C = Compatible method

	When to Inspt	D<30d	D<1yr	D>1yr
STEAM SUPPLY AND RETURN PIPING IN BUILDINGS				
Inspect:				
Steam and return lines for leaks	D R	X	X X	X X
Steam lines for missing or deteriorated insula- tion	D P R	X	X X X	X X X
Steam and return line pipe supports for damage or deterioration	D/P R	X	X X	X X
M & R activities:				
Repair steam and return line leaks	D R	X	X X	X X
Replace missing or dete- riorated steam line in- sulation	D P R	X	X X X	X X X
Repair or replace damaged or deteriorated steam and return line pipe supports	D/P R	X	X X	X X
Flush steam and return lines with fresh water	D/R		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

STEAM SUPPLY AND RETURN PIPING IN BUILDINGS (continued)	When to Inspt	D<30d	D<1yr	D>1yr
Drain steam and return lines	D		X	X
Dry steam and return lines with compressed air	D		X	X
Cover all steam and re- turn line openings with caps, blank flanges, or wooden plugs	D		X	X
Coat all pipe threads and finished surfaces left exposed by disconnecting for draining with a film of graphite and oil	D		X	X
Remove all preservatives from flanges, nipples, and threaded openings	R		X	X
Remove all blanks in steam and return lines and reconnect piping	R		X	X

HEATING SYSTEM

EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

	When to Inspt	D<30d	D<1yr	D>1yr
STEAM SUPPLY LINE TRAPS AND STRAINERS				
Inspect:				
Traps for proper operation	D R	X	X X	X X
M & R activities:				
Repair or replace traps where necessary	D R	X	X X	X X
Disassemble and clean strainers	D R	-	X X	X X
Flush traps and strainers with fresh water and drain	D		X	X

Appendix I: Inspection and M&R Checklists for Cooling Systems

General Notes on Air-Handler Units

A variety of different types of air-handler units (AHUs) may be present in the facilities being deactivated. They include central air handlers, for providing heated or cooled air to the normally occupied zones; roof- and wall-mounted axial ventilation fans for bathrooms, laundry facilities, and mechanical rooms; and various other forced-air units to control temperature or humidity within buildings. Most of these systems consist of an axial or centrifugal fan driven by an electric motor, with some combination of dampers, filters, cooling or heating coils, pulleys, bearings, motor-control center, ducting, and a control system.

Unless the building requires forced-air ventilation, failure of these components during the deactivated period does not put the rest of the facility at risk of accelerated deterioration. However, the cost of complete replacement or major repair of the equipment at reactivation is much greater than the cost of appropriate preservation and periodic maintenance. Some of the AHUs have openings to the building exterior through a roof or wall. If these openings are not properly maintained or sealed, significant building damage from water or pest intrusion can occur.

Proper preservation of unused motors includes placing them in an airtight enclosure to prevent dirt and high space humidities from degrading the motor insulation. If the insulation is degraded during deactivation, extra time and effort is required to disassemble and bake out the motor. Some motors may even have to be rewound, dipped and baked, or even replaced.

Permanent filters should be removed and cleaned. Throw-away filters should be discarded if dirty, and the filter bank should be tagged with the size and type of filter required for reactivation of the system. Belts should be detensioned, removed and hung by the drive system. Tags should be attached to pulleys with belt size and type specifications, for easy determination of proper replacement during reactivation.

Fans and motors should be manually rotated during periodic inspection to ensure smooth rotation. If the equipment does not run smoothly, repairs and preservation should be performed. At a minimum, a note should be made of such deficiencies. Fans, dampers, coils, and associated equipment should be cleaned before deactivation to minimize mold, mildew, and other microbial growth during the inactive period. These precautions should help minimize potential indoor air quality problems when the building is reactivated.

Every attempt should be made to prevent moisture damage to motors, bearings, and associated components of the AHU. If the risk of flood is significant, the motor should be removed and stored in an appropriate container to prevent moisture damage. Periodic inspections should include checking all components for water and pest-related damage.

Where AHU systems include fire dampers, these components need to be properly maintained and periodically inspected to control the spread of a fire throughout the building, should one occur while the facility is unoccupied.

Reactivation procedures ensure that all rotating equipment is properly lubricated, balanced, and operating efficiently. Fan belts should be replaced as required and properly tensioned. Dampers and other openings to the outside should be cleared of debris or sealing materials. Filter media should be replaced with clean filters that are free of moisture, mold, or other forms of potential irritants that could cause indoor air quality problems. All systems should be checked to ensure that they are efficiently delivering (or exhausting) the required quantity of air. If the building's occupant or heating and cooling load is different from what it was before deactivation, then the AHU capacities should be checked against ASHRAE* standards, and other applicable standards, to ensure that the system is able to deliver adequate ventilation and conditioning throughout the building.

Subcomponent List for Air-Handler Units

Air Distribution Equipment

Controls

Controls

* ASHRAE: American Society of Heating, Ventilating, and Air-Conditioning Engineers.

Temperature Sensors

Cooling Equipment

Dampers

Dampers

Damper Actuator Motors

Fire Dampers

Equipment

Bird Screens

Coils

Ducting

Fan Belt

Fan Housing

Fan Motor

Fan Shaft Bearings

Replaceable Filter Elements

Weatherproof Fan Housing

Ventilation

Axial Fan

Centrifugal Fan

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

CENTRAL AIR HAND- LERS & VENTILATION EQUIPMENT	When to Inspt	D<30d	D<1yr	D>1yr
--	---------------------	-------	-------	-------

=====

INSPECT FOR:

=====

Outside air intake
birdscreen damage
and holes allowing
animal intrusion

D/R	X	X	X
P			X

Fans, motors, ducts
for moisture, cor-
rosion, or mold and
mildew

D/R	X	X	X
P			X

Fans, motors for
proper operation
and smooth rotation

D/R	X	X	X
P			X

Electrical contacts
controls and
equipment for
corrosion

D/R	X	X	X
P			X

Fire stat and fire
dampers for proper
operation

D/R	X	X	X
P			X

Drive belts for
tension and wear
requiring replace-
ment

D/R	X	X	X
-----	---	---	---

Filters for clean-
liness

D/R	X	X	X
-----	---	---	---

=====

M & R ACTIVITIES

=====

Repair OA intake
birdscreen as
required

D/P/R	X	X	X
-------	---	---	---

=====

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

	When	D<30d	D<1yr	D>1yr
CENTRAL AIR HAND- LERS & VENTILATION EQUIPMENT (CONT.)	to Inspt			

=====

M & R ACTIVITIES

=====

Seal outside air intake by insuring that dampers are fully closed.	D			X
Label control panel				
Preserve motor to prevent corrosion & remove or pack to insure dry storage	D			X
Detension belts and lube bearings. Put preservative on un- painted machined areas	D		X	X
Clean fan blades, housing, bearings, dampers. Replace or refresh filter media	D/R		X	X
Lubricate dampers, actuators as required	D/R			X
Install motor, lubricate motor, fan bearings	R			X
Retension all belts	R	X	X	X

=====

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

CENTRAL AIR HAND-	When	D<30d	D<1yr	D>1yr
TERS & VENTILATION	to			
EQUIPMENT (CONT.)	Inspt			

=====

M & R ACTIVITIES

=====

Log any equipment degradation and repair as required during inspection.
 Remove any nests or other materials resulting from animal or human intrusion & reseal equipment.
 Remove moisture from electrical components.

Repair or replace fire stat if required	R	X	X	X
---	---	---	---	---

Open outside air intakes and clear debris	R	X	X	X
---	---	---	---	---

Perform low voltage ohm-meter test on motor for adequate electrical insulation	R	X	X	X
--	---	---	---	---

Dry motors with low insulation resistance. Assemble, lubricate and reinstall or replace	R	X	X	X
---	---	---	---	---

Run fan & check for proper & smooth operation	R	X	X	X
---	---	---	---	---

=====

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====				
MECHANICAL ROOM EXHAUST FAN	When to Inspt	D<30d	D<1yr	D>1yr
=====				
INSPECT FOR:				
=====				
Birdscreen holes or other damage	D/R P	X	X	X X
=====				
Fan and motor pro- per operation by manual rotation	D P R	X	X	X X X
=====				
M & R ACTIVITIES				
=====				
Repair/replace birdscreen	D/R P	X	X	X X
=====				
Lubricate motor and fan bearings	D/R P	X	X	X X
=====				
Clean fan blades, housing, and fire dampers	D/R	X	X	X
=====				
Clean, lubricate bearings, check wiring for damage	R	X	X	X
=====				
Replace or repair motor, bearings as required	R	X	X	X
=====				
Run fan and insure proper operation	R	X	X	X
=====				

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====				
POWER ROOF VENTILATORS	When to Inspt	D<30d	D<1yr	D>1yr
=====				
INSPECT FOR:				
=====				
Birdscreen holes	D/R	X	X	X
or other damage	P			X
(annual periodic)				
=====				
Fan and motor for	D/R	X	X	X
proper operation	P			X
by manual rotation				
=====				
Fire stat, damper				
for proper opera-	D/R	X	X	X
tion				
=====				
M & R ACTIVITIES				
=====				
Repair and replace	D/R	X	X	X
birdscreen	P			X
=====				
Detension belt and				
lube motor and	D			X
bearings				
=====				
Clean fan blades	D	X	X	X
and housing				
=====				
Lubricate fire	D/R	X	X	X
dampers as required				
=====				
Repair/replace fire				
dampers and fire	R	X	X	X
stat as required				
=====				
Rotate fan shaft				
and lube bearings	P			X
as required				
=====				

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====				
POWER ROOF	When	D<30d	D<1yr	D>1yr
VENTILATORS	to			
(CONTINUED)	Inspt			
=====				
M & R ACTIVITIES				
=====				
Replace/repair motor, belt, bear- ings as required	R	X	X	X

Install and adjust new belt and lubri- cate bearings	R			X

Clean fan blades and gravity dampers	R	X	X	X

Run fan and check for proper opera- tion	R	X	X	X

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

LAUNDRY EXHAUST FANS	When to Inspt	D<30d	D<1yr	D>1yr
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=====

INSPECT FOR:

=====

Birdscreen holes	D/R	X	X	X
or other damage	P			X

=====

Fan and motor proper operation by manual rotation	D/R	X	X	X
---	-----	---	---	---

=====

Damper	D			X
--------	---	--	--	---

=====

M & R ACTIVITIES

=====

Repair/replace birdscreen	D/R	X	X	X
	P			X

=====

Remove motor, pre- serve w/appropriate lubricant and put in dry storage	D			X
--	---	--	--	---

=====

Clean fan blades and housing	D/R	X	X	X
---------------------------------	-----	---	---	---

=====

Fix damper closed & label accordingly	D			X
--	---	--	--	---

=====

Lubricate dampers	D/R	X	X	X
-------------------	-----	---	---	---

=====

Install motor, align, adjust and lubricate	R			X
--	---	--	--	---

=====

Replace or repair motor and bearings as required	R	X	X	X
--	---	---	---	---

=====

Run fan and ensure proper operation	R	X	X	X
--	---	---	---	---

=====

COOLING SYSTEM

AIR HANDLER UNITS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

	When	D<30d	D<1yr	D>1yr
FIRE DAMPERS	to			
	Inspt			

=====

INSPECT FOR:

=====

Proper operation				
of dampers, link-	D/R	X	X	X
ages and controls	P			X
(annually)				

=====

M & R ACTIVITIES

=====

Repair/repaint/lub-				
ricate components	D/R	X	X	X
as required to in-	P			X
sure safe operation				

=====

General Notes on Refrigeration Systems

Deactivation procedures are similar to the standard winterization procedures that the installation performs annually to ensure that the refrigeration system sustains no major damage from corrosion, refrigerant loss, motor degradation, or moisture ingestion. Additional care must be taken to clean, paint, or otherwise protect all exposed surfaces susceptible to corrosion. All water-side plumbing should be drained to prevent freeze or corrosion damage. Dielectric couplings should be intact between all dissimilar metal components in the plumbing loops. Pumps and motors should be lubricated and protected from the elements.

Refrigerant should be pumped down into the receiver. Recover any excess refrigerant. Refrigerants should not be purged to the atmosphere to avoid ozone depletion and violation of the Montreal protocol or other standards governing the release of chlorofluorocarbons (CFCs) to atmosphere. Check receiver connections and valves for leaks, and replace or repair any leaking ones to avoid refrigerant loss. Receiver connections and all valves should be checked for leaks and replaced or repaired to avoid refrigerant loss during layaway. The compressor crankcase should be filled with the normal operating oil to cover the seal and main bearings to avoid seal degradation or internal corrosion. These specially treated compressors need to be appropriately tagged to prevent operation until the excess oil has been removed. The compressor valve plate and housing should be flooded with oil.

Disconnect the electrical service from chillers and appropriately tag. Switchgear should be sealed and preserved using procedures similar to those outlined in Volume I of Uzarski et al. [July 1991], Chapter 4).

Periodic inspection of all refrigeration equipment is necessary to identify and correct any significant deterioration resulting from animals, moisture, vandalism, or preservation failure. Nests and other debris should be removed. Equipment should be retreated where the preservation measures are not adequate. Any other degradation should be logged to ensure that it is considered when the post is scheduling tasks and material requirements for facility reactivation.

During reactivation, make sure that all protective coatings and coil, fan, and opening covers are removed. The electrical connections, valves, pumps, fans, and coils should be checked for corrosion and proper operation. Excess oil must be properly drained from the compressor crankcase. Any defective components, including refrigerant seals, belts, valves, etc., should be repaired or replaced before operating the units. When the refrigerant is fully recharged, all components and controls should be tested for adequate and reliable operation. Leak tests should be

repeated to ensure that the compressor is maintaining its charge. Stringent requirements for avoiding CFC leaks during chiller servicing and operation will probably be part of State or Federal law at the time of reactivation.

Subcomponent List for Refrigeration Equipment

Air Distribution Equipment

Controls

- Condenser Water Controls
- Controls
- Motor Control Center
- Temperature Sensor

Cooling Equipment

- Cooling Tower
- Evaporator Unit

Dampers

Equipment

- Axial Condenser Fan/Motor
- Condenser Coils
- Condenser Water Plumbing Loop
- Condenser Water Pump
- Cylinder Valves and Unloaders
- Expansion Valve
- Isolation Valves
- Plumbing Insulation
- Reciprocating Compressor/Motor
- Refrigerant Loop Plumbing

Ventilation

COOLING SYSTEM

REFRIGERATION SYSTEMS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

MECHANICAL REFRIG- When	D<30d	D<1yr	D>1yr
ERATION EQUIPMENT to			
Inspt			

=====

INSPECT FOR:

=====

Coils, surfaces for corrosion	D/P/R	X	X	X
-------------------------------	-------	---	---	---

=====

Lubricant condition and level for motors and other rotating components	D/R	X	X	X
--	-----	---	---	---

=====

Seals, plumbing, drains for leaks and damage	D/P/R	X	X	X
--	-------	---	---	---

=====

Electrical contacts, controls and materials for corrosion	D/P/R	X	X	X
---	-------	---	---	---

=====

M & R ACTIVITIES

=====

Pump down refrigeration system, store refrigerant in receiver. Excess refrigerant shall be properly placed in storage cylinders	D	X	X	X
---	---	---	---	---

=====

Test receiver connections and valves for leaks	D/R	X	X	X
--	-----	---	---	---

=====

Wire brush and clean cooler and condensor coils w/ compressed air	D	X	X	X
---	---	---	---	---

=====

COOLING SYSTEM

REFRIGERATION SYSTEMS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

MECHANICAL REFRIG- ERATION EQUIPMENT (CONTINUED)	When to Inspt	D<30d	D<1yr	D>1yr
--	---------------------	-------	-------	-------

=====

M & R ACTIVITIES

=====

Fill crankcase w/
oil to cover seals
and main bearings-
use oil used in
normal operation of
machine. Red tag
compressor w/:"Do
not operate until
excess oil has been
removed." Flood
valve plate and seal
housing w/same oil

Block off or cover all air discharge and intake open- ings, dampers to coils	D	X	X	X
--	---	---	---	---

Disconnect equip- ment from power and tag "discon- nected from elec- trical service"	D	X	X	X
--	---	---	---	---

Remove fuses, wrap in waterproof paper and attach to equipment. Label fuse and machine appropriately	D	X	X	X
---	---	---	---	---

Remove blocking and other protective coatings on in- active equipment	R	X	X	X
--	---	---	---	---

=====

COOLING SYSTEM

REFRIGERATION SYSTEMS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

MECHANICAL REFRIG- ERATION EQUIPMENT (CONTINUED)	When to Inspt	D<30d	D<1yr	D>1yr
--	---------------------	-------	-------	-------

=====

M & R ACTIVITIES

=====

Drain all water
filled condensers,
cooling towers.
Leave drain open,
put preservative
lubricant on plug
and threads to pre-
vent corrosion.
Blow coils out with
compressed air.
Attach plug to coil
with wire

Log any equipment
degradation and re-
treat as required
during annual in-
spection. Remove
any nests or other
materials resulting
from animal or
human intrusion and
reseal equipment.
Remove moisture in-
trusion from elec-
trical components

Drain preservative oil from bearings and refill w/appro- priate grade oil	R	X	X	X
--	---	---	---	---

Replace fuses and reconnect to power source	R	X	X	X
---	---	---	---	---

=====

COOLING SYSTEM

REFRIGERATION SYSTEMS

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====

MECHANICAL REFRIG- When D<30d D<1yr D>1yr	ERATION EQUIPMENT to			
(CONTINUED)	Inspt			

=====

M & R ACTIVITIES

Open compressor discharge, suction, and refrigerant line valves (except liquid line valve)	R	X	X	X
Reconnect control wires and fuses. Connect to electric service, verify operation	R	X	X	X
Check system for refrigerant leaks; eliminate leaks	R	X	X	X
Retension all belts	R	X	X	X
Replace plugs in water coil and/or cooling tower	R	X	X	X
Reconnect water supplies	R	X	X	X
Check control adjustments and continue leak testing	R	X	X	X
Recharge w/refrigerant as requir				

Appendix J: Inspection and M&R Checklists for Electrical Systems

General Notes

The electrical system is considered a hidden system because a visual inspection will probably not discover many distresses. The components of the electrical system are general, panels, lighting fixtures, equipment, communication, security, and fire alarms. The only component that can be visually inspected is the lighting fixtures. The visible features of lighting at times may add to the historic nature of the building--this is especially true of chandeliers and other light fixtures.

The attached procedural checklists cover general activities for deactivation, periodic maintenance, and component reactivation. Special care should be exercised to ensure that dissimilar metals are not left in contact when circuits and switchgear are deenergized. Additionally, all electrical enclosures should be sealed to the fullest practical extent to avoid moisture intrusion.

Emergency and security systems should be kept energized. These systems include fire alarms, security lights, sump pumps, and the emergency monitoring and control system (EMCS), if used. These circuits should be adequately marked for easy verification of condition and service by personnel performing periodic and emergency maintenance.

The electrical systems should be inspected for proper operation and degradation during semiannual inspections, and after severe thunderstorms or floods. Every attempt should be made to ensure the fire, security, and EMCS systems are maintained in good condition. Special care should be exercised to prevent moisture intrusion and resulting corrosion damage (or fire and life-safety concerns) in these components and systems.

It is possible that semiannual inspections and maintenance may not be adequate for some unique equipment. The manufacturer's literature should be used to help determine the appropriate inspection and maintenance schedule. The National Fire Protection Association document NFPA 70B, *Recommended Practice for*

Electrical Equipment Maintenance, and the Westinghouse publication *Electrical Maintenance Hints* should be used for further guidance on frequency and type of maintenance activities for various electrical system components.

An appropriate recordkeeping system and routine tagging of equipment requiring repair should be initiated at the time of facility deactivation. This will help ensure that critical components and systems are identified and repaired in a timely fashion. All switchgear, transformer equipment, conductor connections, and circuit breakers or fuses must be periodically inspected for poor connections, corrosion, or moisture damage. These conditions could lead to the overheating of components, even in a lightly loaded circuit. Insulations should be inspected for degradation, and all grounding equipment should be tested for proper operation.

If the standard historic scenario for deactivation and periodic maintenance is followed, reactivation of the electrical systems will be relatively inexpensive and quick. A qualified electrician will be required for most tasks, including checking all circuits for corrosion or other degradation, then individually switching each load on. Inspection of any transformers and required maintenance should be performed before circuits are energized. Motors should be tested using a megohmmeter or high voltage DC,* to determine adequate winding insulation resistance and safe operation before being brought back into service. Fuse boxes, circuit breaker panels, and any electrical components with dissimilar metals must be inspected for corrosion. If the mission or equipment to be used in the facility is different than what was used before deactivation, a load survey should be performed to ensure that all circuits—including breakers and transformer equipment—is well matched to the new system loads.

Component and Subcomponent List for Electrical System

Equipment

Motor Control Centers

Transformation Equipment

* DC: direct current.

Fire

Exit Lights

Fire Detection and Alarm System

General

Conductors (Wiring)

Outlets

Switches

Lighting

Interior Lighting (Fluorescent and Incandescent)

Panels

Fused Links and Fuses

Mechanical Circuit Breakers and Boxes

Thermal Circuit Breakers and Panels

Security

EMCS Panels

Security Lights

ELECTRICAL SYSTEM

ELECTRICAL EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====				
ELECTRICAL EQUIPMENT	When to Inspt	D<30d	D<1yr	D>1yr
=====				
INSPECT FOR:				
=====				
All equipment containing insulating oil (transformers)	D/R	X	X	X
Insure power is on to sump pump, security lights	D	X	X	X
Breaker panel moisture, animal intrusion/degradation (QUARTERLY)	P		X	X
Fire/security/sump systems for proper operation (90 days)	D/P/R	X	X	X
Security lights	R P	X	X X	X X
Lights, outlets and switches for corrosion or other degradation	R	X	X	X
=====				
M & R ACTIVITIES				
=====				
De-energize all unneeded lights, outlets, motors at main breaker panels	D	X	X	X
Lubricate all mechanical operating linkages	D	X	X	X

ELECTRICAL SYSTEM

ELECTRICAL EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====				
ELECTRICAL EQUIPMENT (CONTINUED)	When to Inspt	D<30d	D<1yr	D>1yr
=====				
M & R ACTIVITIES				
=====				
Touch up paint to prevent corrosion	D P		X X	X X
Add oil where re- quired	D	X	X	X
Install induction heaters in all de- energized electri- cal panels to con- trol humidity (10 watts/cubic foot)	D		X	X
Seal all breaker panels to prevent moisture intrusion	D		X	X
Remove fuses from unused circuits and plastic bag	D		X	X
Insure that power is on to security and fire systems	D	X	X	X
Replace security lights as required	D/P/R	X	X	X
Log any failed com- ponents for reacti- vation repair	P		X	X
Repair fire and security system as required	D/P/R	X	X	X
=====				

ELECTRICAL SYSTEM

ELECTRICAL EQUIPMENT

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====				
ELECTRICAL EQUIPMENT (CONTINUED)	When to Inspt	D<30d	D<1yr	D>1yr
=====				
M & R ACTIVITIES				
=====				
Remove heaters from all panels and clean contacts.	R		X	X
Check circuit breaker operation				
Check all breakers for corrosion and clean or repair.	R	X	X	X
Test all circuits				
Perform load survey to insure adequacy for expected loads	R	X	X	X
Check all lights, outlets & switches	R	X	X	X
Replace/repair all lights outlets and switchgear which does not meet code	R	X	X	X
Reactivate circuits one at a time and insure proper oper- ation	R	X	X	X
=====				

ELECTRICAL SYSTEM

ELECTRICAL EQUIPMENT - SUMP PUMP

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

SUMP PUMPS AND MOTORS	When to Inspt	D<30d	D<1yr	D>1yr
=====				
INSPECT FOR:				
=====				
Proper operation of sump pump: quarterly with checks after major rain and lightning	D/P/R	X	X	X
Pump motor corro- sion (quarterly)	P		X	X
=====				
M & R ACTIVITIES				
=====				
Repair or replace pump, motor, com- ponents as required	D/P/R	X	X	X
Clean or replace strainer and plumb- ing to drain	D/R	X	X	X
Clean, dry and paint sump pump, motor, access cover	D		X	X
Steam clean and paint pump motor if corrosion is found	D/P/R		X	X
Perform low voltage ohm-meter test on sump pump motors for insulation	R	X	X	X

ELECTRICAL SYSTEM

ELECTRICAL EQUIPMENT - SUMP PUMP

NOTE: D = Deactivation X = Item to be inspected d = days
 P = Periodic S = Same material yr = year
 R = Reactivation N = Different material
 C = Compatible method

=====				
SUMP PUMPS AND MOTORS (CONTINUED)	When to Inspt	D<30d	D<1yr	D>1yr
=====				
M & R ACTIVITIES				
=====				
Dry in a suitable oven any pump motor having low insula- tion resistance	R	X	X	X

Hand test pump motor for ease of rotation	P/R		X	X

Test pump motor under load and in- sure required flow	D/R	X	X	X

Abbreviations and Acronyms

ACHP	Advisory Council on Historic Preservation
AHU	air-handler units
AR	Army Regulation
BRAC	Base Realignment and Closure
BUR	built-up roof
CERL	Construction Engineering Research Laboratory
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
DAPAM	Department of the Army Pamphlet
DC	direct current
DPW	Directorate of Public Works
EMCS	emergency monitoring and control system
HQ HPO	Headquarters Historic Preservation Officer
M&R	maintenance and repair
MACOM	Major Army Command
MOA	Memorandum of Agreement
NCSHPO	National Conference of State Historic Preservation Officers
NEPA	National Environmental Protection Act
NFPA	National Fire Protection Association
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
PMOA	Programmatic Memorandum of Agreement
SHPO	State Historic Preservation Officers

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